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Calls for fully-paid retraining leave

THE impact of increasing computerisation and automation upon industry, and the resultant decline in the demand for many traditional skills has led to calls for a legal right to fully-paid education leave for adult employees.

A consultative paper, published by the government-sponsored Business Education Council, points out that "technological advances are likely in the future to lead to far fewer 'traditional' jobs with the consequent need for employees to be retrained on increasingly shorter cycles."

The paper, "A role for BEC in post-experience business education?", also emphasises that many European countries already have facilities for retraining of employees guaranteed by legislation, and believes that Britain "cannot stand aside from this trend."

Many trade unions share this view.

Ian Benson of AUEW/TASS told Computer Weekly: "There is a very clear need for retraining to be assured by a statutory time allowance. In Italy, this is taken so seriously that up to 150 working hours per year are allowed for education."

Tim Webb, national officer of ASTMS, said: "The impact of modern electronics and, in particular, the microprocessor will mean that a man can expect to change his occupation five or six times during his working life. The lump-sum method of redundancy payment operated at present means that many valuable skills are lost to industry, and a more sensible approach would be to provide full time, fully-paid retaining in its place."

At present the employers' Confederation of British Industry seems to be unaware, at offical level, of the urgency of the problems caused by developments in microelectronics, and no policies on the issue have been discussed, according to a spokesman.

BENSON . . . "In Italy up to 150 working hours per year are allowed for education."

NEWS IN BRIEF

ICL wins £2m oil contract

IN open competition with IBM, CDC, NCR, and Siemens, ICL has won a £2 million order for a 2 Mbyte 2972 for the Abu Dhabi National Oil Co. The final choice was between a Cyber 172 and the 2972 and an ADNOC spokesman said one of the factors that gave the order to ICL was that the company could provide back-up serivce and facilities.

The system, which includes two 7502 terminal processors, will be used for a range of work in connection with the extraction and refining of oil by a number of operating companies for which ADNOC is the holding company.

Naval display

A NEW data processing and display system has been sold to the Navy by Ferranti. For use on the commando carrier HMS Hermes, the system is based on a 250K Ferranti FM1600E computer and is designed to enhance an existing FM1600B system. This is the first time that the FM1600E has been selected for an operational shipborne system.

APL interpreter

A PORTABLE APL interpreter written in a specially designed systems implementation language called IL has been developed by IBM researchers. Said to be capable of running on a range of machines including System 370 and Series 1, the software executes on the 370 only 15% slower than native mode APL/SV.

Military Argus leads at the Farnborough show

A MILITARY version of the Ferranti Argus 700 minicomputer, designed to connect to a new Ministry of Defence standard bus, heads a strong list of computer and computer-based products from UK companies at this year's Farnborough aerospace exhibition.

Other noteworthy computer items at the show, which is open to the public from tomorrow, September 8, to Sunday September 10, include a new version of the Redifon Novoview flight simulator, a military version of the GEC 4080 minicomputer, and a microprocessor-controlled air traffic control voice switching and control system from International Aeradio.

The Argus M700 mini, like the new civic 700F and G versions, is a reimplementation of the processor using AMD 2901 bit-slice microprocessors. It is similar to the 700F with floating-point processor added, but is compactly assembled on two standard Eurocards.

It is designed to interface to the new Eurobus, formerly known as the Modbus.

Features of the M700 include a "very efficient" Coral 66 compiler and the Mascot real-time executive, also under development for the Ferranti F-100L 16-bit micro (see page 7). M700s and F-100Ls could also be attached to the same Eurobus.

Set for use in the successor to the Westland Sea King helicopter, the M700 is aimed at the next generation of command systems.

The GEC 4080M is a rugged packaging of the 4080 mini, and is the first of a range to succeed the GEC 920M. First application will be signal processing in the AEW Nimrod.

The Redifon Novoview SP-2 flight simulation display is an upgrade from the SP-1 version and puts up day, night and dusk displays.

The system is driven by a Texas Instruments TI 980 mini and costs $750,000 to $1 million.

The International Aeradio Stratus voice switching and control system for air traffic and other command and control applications is a space division multiple switching system based on Zilog Z80 microprocessors. Intel 8048 single-chip microcomputers are used in decoding of multiplexed signals and in switching.

Extensive micro plans in UK

THE launch of the National Enterprise Board's microprocessor company, Inmos, has stirred the established semiconductor manufacturers into revealing extensive plans for their operations in the UK and Europe.

The biggest investment reported so far is a planned £10 million for new ITT plants at Footscray, Kent and Freiburg, Germany. The UK plant is expected to become one of ITT's major memory production units, and it may be eligible for support from the Industry Department. At Freiburg a large extension to the present factory is nearing completion to house a four-inch wafer production facility that will use a £1 million electron beam exposure system.

In the UK, National Semiconductor has built a completely new plant at East Kilbride, Scotland, since a fire in April, 1977, and it is now thought to produce the only four-inch wafers in the UK, and it is National's most advanced line.

GEC is also planning a major UK semiconductor in conjunction with Fairchild of the US, but reports that Texas Instruments was planning to extend its component manufacturing in the UK have been denied by UK managing director Robb Wilmot.

● Suggestions last week that the European Commission was preparing a report on European microelectronics technology for presentation next month to EEC officials have been dismissed by the Commission.

In three parts

THERE are to be three parts to the Department of Industry's £15 million scheme to support the application of microprocessors (CW, July 13). Part A, to be administered by the National Computing Centre, will get £2 million and cover training and "industry awareness." Part B, to be run by Warren Springs Laboratory with £3 million, will provide funds to help with feasibility studies carried out by DoI authorised consultants.

Firms will be able to get back up to £2,000 on the cost of studies into the use of micros in processes or end products.

The bulk of the money, £10 million, will be used for Part C of the scheme, which is concerned with funding actual projects.

So far over 40 consultants have been authorised and the Department is awaiting replies from a further 80. Letters of intent approving studies of four projects have been issued.

Cambridge joins the IBM compatibles

THE latest to enter the IBM plug compatible processor market is Cambridge Memories of Cambridge, Massachusetts, which has introduced a machine aimed at the low end of the 370 range from the 115 to the 135.

First customer for the Cambridge machine is National CSS, which is already supplied with an IBM compatible processor, the V32, by North American Philips subsidiary, Two Pi Inc (CW, April 27).

National CSS has ordered two of the Cambridge machines for internal software development use and will also evaluate them to assess the viability of Cambridge as a second source to the Two Pi processor.

National CSS is now selling the Two Pi V32 to end users as the NCSS 3200, along with its own operating system, VPS, and hopes to introduce the 3200 in Europe from next year.

Cambridge says that its machine is based on the Omega processor which is sold to end users by Control Data as a 370/148 replacement. Omega is manufactured and supplied to Control Data on an OEM basis by IPL Systems, a firm run by ex-Cambridge employees and 40% owned by Cambridge.

The Cambridge machine can be configured to look like a 115, 125 or 135 by changing the number of channels and size of the memory. Maximum main memory size is two Megabytes.

Briefing

Univac pulls out of PoS

STRONG consumer resistance to point-of-sale equipment is being blamed by Univac for its decision to pull out of the market in the US after a five-year involvement.

Existing users of Accuscan equipment have been told that the company will buy back the equipment on a time-used basis, or will maintain it until 1985.

Lomac switch

UK EXPATRIATE entrepreneur John Peers has been removed from the day-to-day control of Logical Machines Corp, the Californian company which he set up to take over the production and marketing of Adam, the small business system he introduced in 1975 (CW, March 20, 1975).

Operational control of the company has now been taken over by Jerry Brandt who joined the company last year to reorganise the newly-acquired Byte Industries. He told Computer Weekly that because of the growth of Lomac it needed a different type of management. The company is reported to have had problems because of software promises that had been made to some Adam customers. Brandt said he expected Lomac to do better this year, but did not forecast a profit.

Peers, who has been in hospital, remains chairman of Lomac and president of the board, and will be responsible for long term planning.

BASF add-on

ADD-ON memory for IBM mainframes from the 370/135 to the 3033 has been introduced by BASF. Called the BASF 6500 Memory, it enables storage to be expanded well beyond the IBM maximum and provides features like single-bit error detection and correction, and detection of all double and multiple bit storage errors.

MICA sales deal

AN international marketing agreement has been reached between Digital Equipment and Warren Point, of Stevenage, that provides the MICA compiler, a machine independent compiler for the ATLAS automatic test program, on PDP-11 computers. DEC plans to sell complete test systems hardware, with Warren Point providing the MICA package. In the US, MICA will be available under a licence agreement.

French micro talks

TALKS are being held between Motorola and French electronics group Thomson CSF that could lead to a joint semiconductor design and manufacturing operation in France similar to the joint venture being established in the UK by GEC and Fairchild. The French are already near to launching a company similar to Inmos, called Secimos (CW, August 17).

Desmond Pitcher

Plessey telecoms chief

WORLDWIDE telecommunications activities of the Plessey group are to be directed by Desmond Pitcher, a former chief of Univac in UK and Europe. Pitcher, 43, is taking up the newly created post of managing director of Plessey Telecommunications International and will be reporting to Dr Bill Willetts, chairman of PTI and deputy chief executive of the Plessey group. Among the Plessey chief executives who will be reporting to Pitcher will be Maurice Glynn, of Plessey Telecommunications, Liverpool; Jack Donnelly of Communications and Data Systems, Beeston, Nottingham; Eric Clark, of Plessey Controls, Poole, Dorset; Gordon Patterson of Telecommunications Research, based at Taplow, Berks; and John McDonald of Overseas Operations.

Anti-US feeling grows in SA

IN AN environment of strong anti-American feeling, rumour that IBM might withdraw from the local market has taken root in the South African computer community, despite strong denials by IBM (writes Esmond Frank from Johannesburg).

The South African company Data Management Systems is investing £175,000 on a new factory in Pretoria where it will build the SyFA originally developed in South Africa.

Another local company, Daktor, which has acquired the franchise to manufacture the American General Automation systems (CW, April 20) expects local production to begin later this year.

16-bit micros star at Wescon show

From Martin Banks in Los Angeles

HIGHLIGHTING the growing difficulty in differentiating between some electronic components and DP-oriented systems, at this year's Wescon exhibition and conference in Los Angeles, the new 16-bit microprocessors are among the star items to be presented.

With three recently declared contenders, Intel, Zilog and Motorola, and National Semiconductor as a possible fourth, the marketplace for these devices is warming up, and the conference sessions are the forum in which these three will be discussed. Only Intel, with the 8086, has a product available as yet, with Zilog's Z8000 due towards the end of this year and Motorola's 68000 expected early next year.

Main features from the semiconductor industry on display at the exhibition include the first public showing of Motorola's 6801 single-chip microcomputer. Introduced earlier this year, this features an enhanced 6800 family processor together with 2K bits of ROM and 128 bytes of RAM. It has four I/O ports, three of eight bits width and one of five bits width.

Mostek is showing a new family of microcomputer boards that meet the new STD bus which has been jointly developed by Mostek and Pro-Log. The boards feature a new 56-way bus structure and the single-card microcomputer of the family is based on the company's version of the Z80 microprocessor.

A high-powered development system called Starplex is being featured by National Semiconductor. Using three coupled 8080A micros, it gives keystroke control over a macro-assembler, Fortran compiler and Basic interpreter together with a text editor

The semiconductor division of Harris, is exhibiting Micro 12, a $550 all-CMOS board computer which can run PDP-8 programs directly. It is based on the HM 6100 CPU, a second-source version of the Intersil 6100 12-bit device.

For PDP-11/03 and LSI/11 systems from Digital Equipment, Datel Systems is showing a new range of A/D and D/A converter cards which fit in to DEC card cages, providing an analogue signal front-end capability for these systems.

Amdahl ousting IBM at BA

By TIM PALMER

SUBJECT to UK government approval, British Airways is about to give Amdahl its largest-ever European order, involving two super-large 470V/7 mainframes and two 470V/5s. The order is likely to be worth around £8 million.

The order is a big blow for IBM UK, representing the loss of possible orders for four large 303X systems.

The V/7s are to replace the two 370/168s on which the British Airways Babs reservation systems run and the V/5s are believed to be for running reservations systems for other airlines.

The natural IBM growth for the 370/168s would have been to 3033s while the V/5s are likely to replace an order for two 3032s which British Airways were negotiating with IBM as replacements for five ageing 360/65s (CW, July 20).

A switch to a plug compatible mainframe supplier by British Airways is in line with its past computing policies. Most of the peripherals on the British Airways mainframes come from plug compatible vendors, and over two years ago, British Airways terminated its maintenance contract with IBM, signing up Data Processing Customer Engineering, the Sydney-based company which does maintenance for Quantas (CW, March 11, 1976).

The 470V/7, first deliveries of which took place last month, is claimed to be considerably more powerful than the 3033.

British Airways is likely to become the first European user of the 470V/7, and also the first airline to run its reservation system entirely on a plug compatible machine. American Airlines has a 470V/611 in Tulsa, Oklahoma, soon to be replaced with a V/7, which is used mainly for commercial applications, but is also used to run the Airline Control Program reservation software at peak times, taking on some of the load of an IBM 370/168 Attached Processor system (CW, January 12).

A British Airways spokesman would only say that it has a requirement for new equipment and is exploring the options open to it.

Anti-Inmos action goes ahead

THE legal action in the US against Inmos in which Mostek is attempting to enjoin its former employees from passing on trade secrets is being pursued by Mostek. Former Mostek employees now working for the British company include Inmos managing and deputy managing directors, Richard Petritz and Dr Paul Shroeder.

A Dallas court granted Mostek a temporary injunction against Inmos early last month (CW, August 17), and on Monday the two parties appeared in court to enable the judge to issue what US law terms a preliminary injunction. This is enforced until the full case is heard.

Mostek's action is essentially over methods used to fabricate the 64K RAMs which Mostek intends to introduce and which Inmos will probably also manufacture.

Inmos reaction to TI 64K devices, see page 11.

CEGB to get ICL 2976

DESPITE some opposition from its regions, the Central Electricity Generating Board headquarters is to get an ICL 2976 to provide conversion facilities for 2960 systems that will be replacing ICL 1903T and 1904S systems at regional centres.

The 2976 is likely to be run at the Bracknell bureau Computel on a facilities management basis. Some regions would have preferred the conversion facilities to have been on a bureau basis but the CEGB believes it will be more economical to have its own large 2900.

The 2960s at four of the five CEGB regional computing centres will run under VME/B from day one and all new systems will be developed and implemented in native mode. Existing applications will be gradually converted over a period of about three years using online terminal links to the 2976.

The two 2960s going to the South Western regional centre will be DME machines because a number of new systems there are at a more advanced stage of development on existing 1904S kit and need the extra power that the 2960 can provide, even when running under DME.

A CEGB spokesman said that the 2976 might be sold to Computel at the end of the three-year conversion period although he stressed that the deal had not yet been finalised.

COMPUTER WEEKLY'S INSIDE NEWS

NETWORK BLIND ALLEY?

Most European PTTs are developing data network services of one sort or another, but which has chosen the right approach? The technological and economic dilemma that faces these authorities is examined by Fred Lamond in Marketview in this month's International section. Circuit switched, packet switched or leased channel, which is the right system? Or are they all blind alleys? Pages 30/31

Other features in the section include a report from Budapest by Keith Jones on banking systems; a preview of Sicob in Paris by Tim Palmer, and reports on the American scene by Hesh Wiener and Cameron Davis. There is also the usual wide coverage of world computer news. Pages 27/37

VOICE OF THE USERS

As in Europe, data communications is one of the expanding areas for the application of computers and at last the users are beginning to make their voices heard in the policy making debates. Morris Edwards looks at some of the latest moves in the game. Page 18

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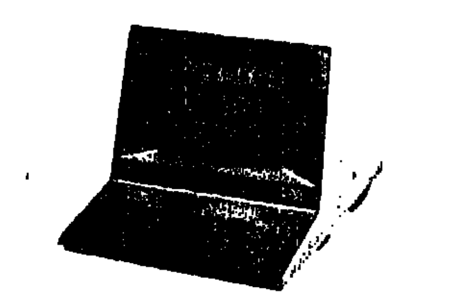
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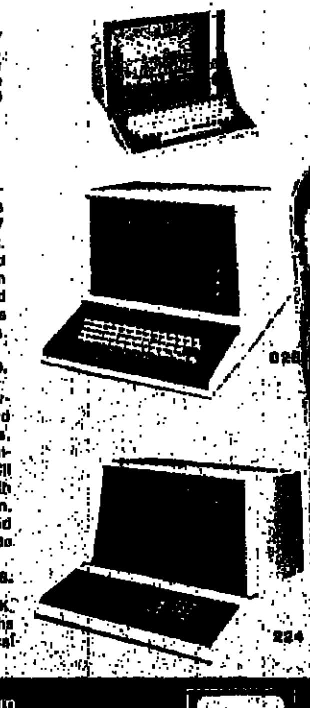
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In this Guest Computerview, HESH WIENER, Computer Weekly's American correspondent, looks at a US presidential report on technology transfer.

Big Brother for sale

LATE last month the White House sent the US Congress a 44-page report on technology transfer. Technology transfer is, according to this paper, "the act of conveying know-how from one country to another."

The legislators may have got exactly what they asked for; but if they did, America is in trouble. The White House sent Congress nothing but pap.

While the report politely answered questions about nuclear weapons and military aircraft, it failed to address an issue that President Carter is quite familiar with, one that has made headlines recently and which promises to make more news in the immediate future: computers and how they shape the world.

That computers interest the military is without question; that they are important to the Administration may be inferred from President Carter's own experience.

Just a few weeks ago the President said he would refuse the Soviets a large Univac computer for Tass, the Russian news service (CW, July 20). The embargo was a response to the way the Russians treated a dissident computer scientist, Anatoly Scharansky. (However, President Carter overlooked an IBM 370 being installed for use at the Moscow Olympics.)

Earlier, the White House had turned down a Soviet bid to buy a Control Data Cyber 76. While the machine was supposed to be used for weather forecasting, President Carter acceded to the proposition that the computer could be diverted to military uses.

Even before he was nominated for the presidency, then-governor Jimmy Carter, spoke to the National Computer Conference on the importance of information technology.

Computers comprise the largest single category of manufactured goods that the US exports and the odds are that computers will become even more lucrative during the coming years. Many other countries already pay homage to US technological leadership.

Even Eastern Europe has copied old American designs for its Rjad series of mainframes. The Japanese have begun to compete in world markets; their offerings are beautifully-made copies of IBM equipment, some of them sold through American marketing organisations. In Germany the most dynamic figure in the computer business, Heniz Nixdorf has unashamedly modelled his multinational organisation after IBM. And so it goes around the world (with the exception of Britain's ICL, which has always taken an independent design path).

Why, then, did the White House gloss over the transfer of such an important technology in its report to Congress? The answer may lie with the entanglement of computers and human rights. Computers are of particular interest to dictators.

Although America shouts about human rights for dissidents in communist countries, it quietly automates the police forces of comparably repressive non-communist regimes. However, it is more difficult to confront capitalist neighbours to the south, such as the Brazilians, who have recently been allowed to buy automated fingerprint systems from Rockwell International (CW, July 13).

American companies have installed their most advanced police communications products in Argentina (CW, March 31, 1977).

Chilean refugees claim that the dictatorship there uses computers to keep files on its citizens, although the American companies that have sold systems to that government deny that their machines are used as tools of repression.

The United States is not alone in its contribution of computers to questionable governments, nor is it without some remorse. The US has asked its computer manufacturers to reduce their dealings with South Africa, in particular with the sale of systems for use by the South African police and defence forces (CW, March 16).

But at the same time, General Automation, the California minicomputer maker, licensed its designs to South African electronics manufacturers (CW, April 20).

If President Carter had not been brought close to this issue by his own experience or that of his Cabinet, he could scarcely have avoided the voices on Capitol Hill raised to question the wisdom of free trade in computer systems. Senators of differing views have spoken eloquently about the need to think deeply as we sell our computers to one brutal government or another.

It is not enough for the White House to take predictable stands on the control of nuclear knowhow or the sale of electronic radar jammers. While tomorrow the United States might proudly face the historians as the nation that had sought to stop the spread of breeder reactors, it is more likely that it is headed for a less honourable place in the annals of mankind.

Americans may well go down as the people that sold the world 1984 — and called it technology transfer.

INTERRUPT

THIS is a tale of times long ago when the venerable Atlas I at Chilton possessed sixteen 1in tape drives as its main backing store together with a high speed drum.

Being heavily used, the tape drives frequently developed errors, which involved switching the tapes from one deck to another.

One day the operators realised that a certain drive was performing particularly well as it read without errors tapes that had failed on other decks. Then a system tape failed and it was duly transferred to the "good" drive. This led to a number of very heavy operating system crashes.

It was then realised that the good deck had really been extremely naughty. For it had a fault of its own — it failed to register that it had detected bad data.

The moral: All that flatters is not good. Or don't rely on hardware checks alone.

● This week's £5 prize is won by David Fletcher of Wokingham, Berks.

FOCUS

Bridging the good relations gap

ONCE again, the formidable team of Computer Weekly, Nigel Laurie of Communication Audit, and the Institute of Data Processing Management, have joined forces to tackle the spiky problem of user relations (see page 15). Let's hope that this time round the users also get the communication message.

User departments appear to operate under somewhat different procedures from the DP operation. It is not unknown for the entire user department to shut down and undertake a day trip to Runcorn or perhaps compete in the company golf competition. In comparison, Computastars events are scheduled out of normal installation hours.

It takes two parties to establish successful relations. The days when the DPM laid down the computer law have been long distributed along with much of the configuration.

No doubt there are still computer outposts of power, where DP law is standard company issue. Certainly user power hasn't yet infiltrated the banking computing parlours. Banking installations are noted for doing their own thing, irrespective of the needs of the users — whether customers or bankers. It is strongly suspected that bank managers spend much of their time lurking in their cupboards as a method of avoiding truculent customers and incomprehensible print-outs.

This attitude of closed minds was admirably demonstrated at a recent banking seminar when the chairman responsible for developing a new computerised clearing system turned down a suggestion for a user group to be formed. "The computer committee could be relied on to act in the best interests of all concerned." was his helpful comment.

Fortunately such abuse of power no longer resides with many DP managements. They are all too aware of their responsibilities. The dedication of the DPM extends more to his company than to the DP industry — a fact of computing life which has yet to be appreciated by those preaching the noble art of computer professionalism.

The Computer Weekly workshop on Successful User Relations is being promoted as a practical session. No doubt therefore each delegate will be issued with a phone, directly linked to an average user. Other phones will be online to the ops room, engineering support and stationery supplier. Outside the venue will be a queue of disgruntled DP personnel demanding that unless their abilities are further recognised, resort will be made to the back pages of Computer Weekly.

Meanwhile current computer technology is playing its part in bridging the relations gap. The mini and micro is moving into the user's domain. Practical user application packages are available, off-the-shelf.

The future may be uncertain. But good relations are by no means bleak.

COMPUTASTARS

Champs' day at the Palace

THERE are 54 teams, 30 men's and 24 women's, in the final line-up for the Computastars championships at Crystal Palace, London, on Saturday, September 30. The competition is going to be fierce in this biggest athletic contest ever staged for computer people. It will also be a great day out for the family and advanced bookings have been heavy. These are now closed but tickets will be available at the gate, 60p for adults and 30p for children. Refreshments and bar facilities will be available.

Trophies, given by the Ferguson-Francis consultancy partnership, will be presented to the winning men's and women's teams, and trophies for the individual men's and women's winners are being provided by Computer Weekly. It is also planned to give commemorative medals to all members of the winning teams and to the first three in the individual classes. These are being presented by Wright Air Conditioning.

For competitors who are knocked out of the contest early in the day, the fun won't be over. A tug-of-war has been organised, with refreshing prizes for the winners, and to exercise the mind as well as the muscles, teams are invited to enter a slogan competition. The most apt will be displayed on the giant Crystal Palace electronic scoreboard and the winning entry selected by a Computer Weekly panel.

To round off the day, there will be a Computastars disco in nearby Croydon. This is mainly for competitors and their partners but a limited number of tickets is being made available to supporters. The price is £1 each including food and drink to the music of the Sea Sound.

Computastars has been organised by Goldsmith Recruitment International with the support of Computer Weekly.

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Ten years ago...

COMPUTER WEEKLY SEPTEMBER 12, 1968

THE use of time sharing techniques by even the smallest computer user has become a practical proposition with the introduction of Time Share-8, based on the Digital Equipment PDP-8/1. Costing between £20,000 and £50,000, the system can handle between eight and 32 terminals simultaneously . . . Punters using the Tote will have their bets processed by twin CDC 3300s in 1971 when plans announced by the Totalisator Board come into operation . . . The Postmaster General, John Stonehouse, gave details of GPO plans for better data transmission services. They were being introduced to keep up with the "explosive pace" of demand and to help meet customers' special needs . . . Friden launched the 7100 series of terminals . . . A letter from Donald Michie called for government support of DP in the market place.

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'IBM: THE NEXT FIVE YEARS' CONFERENCE

Shift from program to data design

THE 1980s will see a shift away from program design and towards data design and procedural languages like PL/1, Cobol and Fortran will be seen to have run their course. This is the view of Amdahl's senior vice-president for corporate marketing, Bill O'Connell, who was speaking at this week's second "IBM: the next five years" conference, organised by Infotech.

"There is a lot of data within programs which just should not be there," he said, citing as an example field lengths, which can cause a major upheaval in a system if, for example, an organisation which uses a five-digit code for the employee identifier grows to the point where it takes on more than 100,000 people.

"Data in the 1980s will be independent of classification, and dependent on its meaning to the business," he said.

"Applications will be dependent on business strategy, but independent of the current state of the business, so that they can accommodate change. And I believe that the pace of change in business will speed up, rather than slow down, as companies try to become more competitive."

O'Connell saw this as a logical extension of the development from monthly response times in the early Sixties which became weekly, and then daily. In the early Seventies and are now down to 10 seconds.

Pointing out that a transaction which took 5,000 instructions in the 1960s required 150,000 with the IBM IMS database system, he was confident that users would be able to absorb all the increases in computing power the industry could provide.

He also revealed that Amdahl was preparing for IBM to reduce the path lengths within IMS and to introduce a new disc subsystem with intelligent controller.

A speech synthesis circuit on a single P-channel MOS chip forms the heart of this learning aid, called Speak and Spell, from Texas Instruments. It has been designed by TI to help children in the 7-12 age group learn how to pronounce over 200 basic vocabulary words that are often mis-spelled — like language and anxious.

It pronounces each word randomly and the child keys in his spelling of it on the alphabetic keyboard. Speak and Spell then responds either with praise or with encouragement to try again and, after a set of 10 words, it announces the child's score. Speak and Spell can also teach pronunciation by displaying the word first and pausing to give the child a chance to say it out loud before giving the correct pronunciation.

Speak and Spell will be available in the UK later this year at a cost of about £35.

Operators accept original offer

THE operators at GEC Telecommunication's Stoke, Coventry plant, who went on strike for four months over a pay claim (CW, March 9), and then agreed to go to arbitration (CW, July 20), have now accepted the company's original offer.

They informed the company of their decision at a meeting between the management and the union held in Coventry last week. One of the operators said: "We couldn't agree on the arbiter. Anyway, the whole of the GEC Coventry branch of ASTMS is to go before ACAS (the government's industrial and arbitration service) for next year's claim, so we decided to go along with that."

The pay rise comprises increments of £2, £3 and £4 per week, for operators, senior operators and shift supervisors respectively. It is backdated to January 1.

Supercar micro sought in US

ATTEMPTS are being made by Aston Martin, the car manufacturers, to find a US microprocessor-based instrumentation system for its 140 mph Lagonda supercar after plans to use one under development at the Cranfield Institute of Technology in Bedfordshire have been dropped.

Court action may be taken by the Cranfield Institute, although the nature of the dispute has not been revealed. No reciprocal action is being taken as yet, according to an Aston Martin spokesman.

The Cranfield micro system was intended to give the driver facilities such as instant readings of average speed and/or fuel consumption, but after some problems were encountered only a few prototype models were fitted with the equipment. Production of commercial models without the system has gone ahead and according to Aston Martin these should be ready for delivery early next year.

UKAEA's 2900 compiler to run IBM programs

TO ensure that user programs can be processed on its ICL equipment, compilers used by the United Kingdom Atomic Energy Authority have been adapted to cope with programs written for IBM systems. This is expansion of AEA computer power which has given ICL an order worth £13 million.

The equipment includes two dual 2976 systems and enhancements for the 2980 already in operation at Risley, Lancs (CW, May 25).

Each of the 2976s will have eight Mbytes of store and the 2980 enhancements include a second order code processor with eight Mbytes of store, a further four Mbytes for the present OCP, and eight EDS 200 disc drives.

The tuning of the 2900 compiler to handle IBM programs will meet the needs of AEA users many of whom operate with IBM equipment, and includes system run on the authority's own 370/168 at Harwell.

The compiler facility will also aid scientists from EEC countries and Sweden who will be working on the JET, Joint European Torus, project which is being established on a site at Culham.

A spokesman said that the use of an ICL DAP was still being considered (CW, May 25) but there were no immediate plans for such a system.

More details have also been released about F. W. Woolworth's plans for a major 2900 complex to serve the group's £800 million retailing operation (CW, August 17).

The £3.8 million order includes a dual 2960 due to be delivered next year and a dual 2972 for delivery in 1981. One of the 2960s, a two Mbyte machine, will be used to develop programs under VME/B in preparation for the 2972 system.

Using George 3 DME, the other 2960, with one Mbyte, will gradually take over the present 1900 workload which runs on two 1904S systems, a 1904A and a 1903A. The whole complex is scheduled to be converted to 2900 working by 1982.

GOVERNMENT COMPUTING

SCOTTISH OFFICE

Computer Terminal equipment is required for installation at 6 locations in Edinburgh. VDU's having the functional characteristics of IBM 3270 terminals, together with associated control units and printers, to link to the Scottish Office Computer Service IBM Main Frames is required at all 6 locations. Teletype compatible Terminals to link to any appropriate installation is required at 2 of the locations.

Proposals may be submitted for either or both of these requirements.

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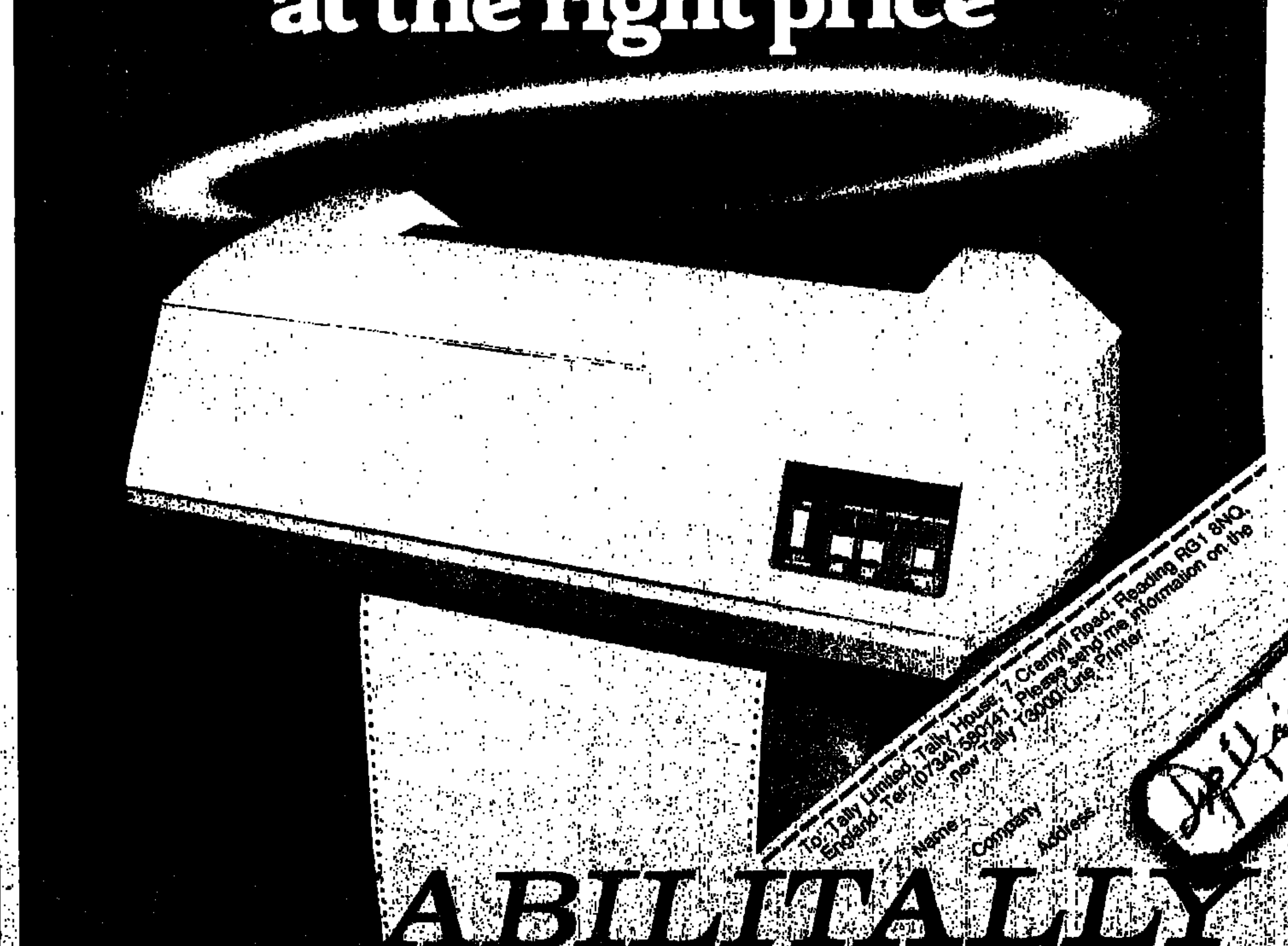

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can Basic ever hope to tell
what makes a friendship boom and gel?
can loving, longing be replaced
by symbols on magnetic tapes?

Computer Man when you reply
a Subject Package please supply
for processing emotions by

can lonely walks
and Mozart airs
and table-tennis
in mixed pairs
and freckled hands
that deftly play
sweet songs to while
the night away
and twinkling eyes
and yellow car . . .
a 'normous list
too long by far
to feed into your comput – ar

can such dear input be reduced
to codes electric'ly produced?
this is the package I require

in Cecil or David to buy or hire
the Computer Age is an age of speed
but slowly, slowly we proceed

tutor me – program me.
feed me the Data
to process and store
in my . . . cerebral crater (whew!)
for there's certainly
learning and loving ahead
and it may not all be
in a Graph Plotter's Bed!
"Computer Liaison"–
I wish I knew
if there's to be
a liaison with YOU!

Elizabeth Proctor

"Tell me, Mr Robinson, how long have you felt you were a computer?" "0110000111011110101 clock cycles . . ."

Who wants to be a millionaire

SOME interesting thoughts about Britain's microelectronic future from Daniel Yergin of the Harvard Business School writing about UK taxation and industrial policy in the magazine New Republic:

"I sat in on a discussion among influential, committed individuals on the left side of the Labour Party. They were debating microprocessors.

Was Britain to have its own microprocessor industry or not? If it did, then its very existence would involve the possible creation of new British millionaires. They didn't want any new British millionaires since they were still trying to figure out ways to get rid of the old inheriting kind. On the other hand, they admitted, without risking millionaires, such an industry was unlikely to get going in the UK, which would mean that Britain would import its microprocessors from the US — thus creating new American millionaires, or adding to the wealth of the existing American millionaires.

"There was no question in the minds represented: better to prevent the rise of new British millionaires and let the industry remain in America.

This is not exactly an atmosphere conducive to industrial reconstruction. The consequences of this environment — of course, reinforced by traditional values and class barriers — is that such entrepreneurial energy as there is in Britain goes into ventures like property speculation,—a particularly unproductive and often unhealthy activity."

One of the subtler but nonetheless important changes brought about by the impact of information technology is the way it alters control of and access to information.

As pointed out in Computerview (CW, September 7), this change could exacerbate social divisions. But in this article, SAM FEDIDA, the designer of one of the most significant information technology inventions, the British Post Office's Prestel viewdata TV-based information service, suggests that the new technology could lead to a re-emphasising of the value and importance of individuals and to a more informed and more participatory democracy. Fedida invented Prestel while working at the Post Office. He is currently a consultant on information services and is assisting the National Enterprise Board's Insac in the worldwide marketing of Prestel.

The social impact of viewdata

TO TRY to discern what might be the social implications of viewdata is like trying to guess the social changes, indeed the revolutions, in religious, philosophical and scientific thinking and changes in social and industrial structures which we not know were the consequences of the introduction of printing by Caxton.

Looking back, we now know what enormous influence printing has had on the daily lives of the common people, in liberating the human race from the slavery which might have been its fate for all times and not that invention taken place. Even now the process is hardly completed.

As printing made possible the wide dissemination of information and so enabled, gradually, the man in the street, to learn and develop intellectual abilities, so will viewdata create a similar revolutionary change.

There is now clearly no lack of information around. Indeed, there is far too much of it; so much that the sheer labour of dealing with the increasing deluge of written material of all kinds, much of it, irrelevant, often misleading, and frequently false, is so large that the task of reading, sifting and classifying is virtually impossible.

The individual is seldom able to find the information he wants, when he wants it, unlike the large organisations which have the help to sort out the essential information they require.

To the current information chaos which society has contrived to create, because of its avidity for information and knowledge but the lack of adequate means of control, viewdata brings order, structure and a ready means of retrieving the information one requires as the need arises.

Information is power; power to decide intelligently, to weigh alternatives with the relevant factors at hand; power to understand people's true motives; power to distinguish the true and the false; power to see and seize opportunities for a better life.

Clearly this facility of instant access to all the information that all people require will not be available immediately, perhaps never fully.

This new power will bring with it dangers and opportunities.

There is the danger that viewdata will be made the vehicle for information intended to deceive, to misinform or simply to be irrelevant, a convenience rather than a new tool for social development and advancement.

The opportunities, on the other hand, are great, but in their wake it is not inconceivable that substantial changes, perhaps even revolutionary changes, similar to those which resulted from the invention of the printing press, might well occur; changes which will restore some balance to the disparity between the overwhelming power of large organisations and that of the individual.

SAM FEDIDA: A revolutionary change . . .

What would be the result if, for example, at election time it were possible to examine the record of the various parties involved in the contest, the records of the individual candidates, how their opinions were matched to their actions, their antecedents, their political activities in the past and in other contexts, their involvement in important events and on important issues long since buried in the mass outpourings of the media?

It is a saying that the memory of the electorate is very short. The reason why this is true is because it is of the difficulties of documenting the mass of details that need to be marshalled to form an intelligent and well informed opinion.

With viewdata this need no longer be the same. The memory of the electorate could be as long as the community desires, when backed by relevant information, classified for easy retrieval, easily accessible and within the financial means of all.

One major feature of the development of society in the second half of the twentieth century has been growing disparity between the power of the large organisation, and particularly of the state apparatus, on the one hand and that of the individual on the other. Paradoxically, this has developed in parallel with an apparent concern and care on the part of society for the disadvantaged.

In this situation, conformism is the rule and no allowance is made for those who, though not obviously underprivileged or disadvantaged, may hold views and opinions not shared by the majority or at least by a substantial pressure group. Thus individual freedom in the intellectual, social and economic spheres has been continually eroded.

Viewdata provides easy availability of detailed and comprehensive information on questions such as the comparative advantages of alternative education systems, systems of industrial democracy, relative productivity in various countries, the extent of social services and the relative military strengths of other states.

With such details made available to public scrutiny instead of being the preserve of the few and often hidden from the public gaze, more power could be given back to the individual citizen.

It has only been possible in this short article, to touch upon a single feature of viewdata: the enormous enhancement of individual choice and freedom.

Other features, such as improved educational opportunities and facilities, enhanced awareness of the total context of society, its economic and cultural and political aspects, all point in the same direction — to a vastly increased potential for individual opportunity.

It is this which is the most dynamic, perhaps explosive, of all technological developments, as it re-emphasises the value and importance of the individual, against the trend of modern society. The consequences of this re-orientation will be at least as far-reaching as those resulting from the invention of the printing press.

Seminar on viewdata

Sam Fedida and journalist Rex Malik are to give a seminar on the business opportunities and implications of viewdata in London on November 21 to 23. The fee is £285, but there is a £50 discount for booking made before the end of September. For further information contact Viewdata Registrar, ECC Ltd, 2 Duncan Terrace, London N1 8BJ (Tel: 01-278 9517).

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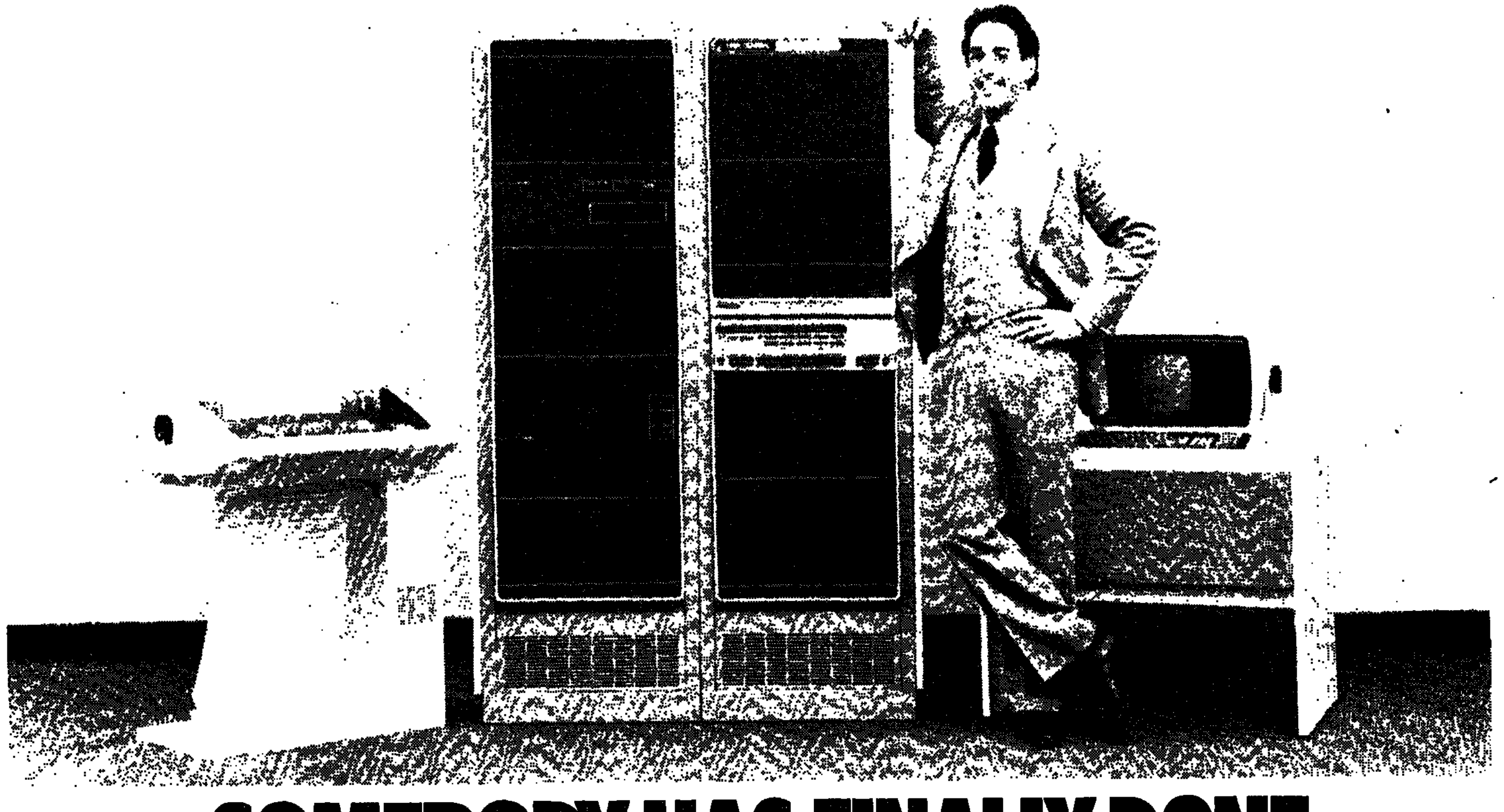

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MICHIE'S PRIVATEVIEW

Such is the lure of simplicity

EARLIER Privateviews have mentioned information systems too complex to be comprehended (CW, January 19 and July 20). The human mind responds to complexity with simplifying slogans, at a cost to accuracy which varies from case to case. "When defending with king and rook against king and queen" says the chess-master, "always keep king and rook together" and he does not err. But "With king and knight against king and rook, keep king and knight together" is sometimes wrong, and "After 1. P-K4 . . . White's game is in its last throes" is not more than amusing — comparable perhaps to Nancy Mitford's Uncle Matthew on the wider game of life: "Abroad is bloody, and foreigners are fiends."

At no time are the mind's simplifications more active than when under stress of emotion. As a graduate student at Oxford I sat thunderstruck through an altercation at a crowded departmental seminar. Our Reader in Cytology John Baker, subsequently elevated to the Royal Society, was attacking the seminar speaker, none other than Dr J. B. Rhine.

Rhine was founder and director of the Institute of Parapsychology at Duke University, North Carolina, later to be tarnished by the departure of its deputy-director caught in flagrant scientific fraud. But even at that early date Baker, a passionate scientific rationalist, felt that there was a rat to be smelt somewhere.

Grey-suited and manicured, Rhine suavely parried each thrust, scattering a largesse of cute remarks. So one might seek with parasol and peanuts to deflect the mighty rhinoceros. John Baker, his voice a clarion, returned to the charge: "When Galileo dropped his balls from the leaning tower of Pisa . . ." It was enough. We had been stretched on the rack too long. I still hear the deafening shout of laughter as the hall exploded.

No-one, least of all the normally meticulous John Baker, noticed that he had it all wrong anyway. Galileo did not drop his, or anyone else's balls. He rolled cannon-balls down an inclined plane. Baker had momentarily simplified by confusing this with a weight-dropping demonstration made earlier by the Dutch engineer Stevinus.

When simplifications reside in the phenomena themselves and can without cheating be conjured forth, there lies the gifted experimenter's greatness. Foucault's coup de theatre in 1851 with a pendulum strung from the ceiling of the Paris Pantheon was of this kind. Michael Pentz, Dean of Science at the Open University, has repeated it using the 288-foot high dome of St Paul's. A brass ball of 150 lb weight, set swinging in a 30-foot straight traverse, progressively knocks down a circle of sand on the floor. As the earth rotates beneath it, so the pendulum's swing, by insensible shifts, changes direction and in course of time would move through the complete 360°.

"Aha!" we say, "Of course!" and then "Beautiful!" Such is the lure of simplicity.

But in pursuit of this lure, our minds are prepared to tell us the most extraordinary lies. Next Privateview will examine one of these, concerning the great astronomer-phycist Galileo.

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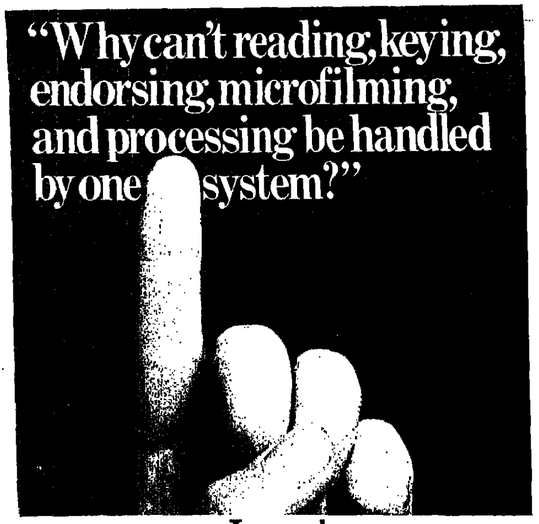

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SOFTWARE FILE-1

Altergo puts 'one-way flow' of technology from US into reverse

CRACKING the US treasure chest floating in a sea of IBM installations is the dream of many European software and services companies. But the path to that lucrative goal is full of unexpected dangers and pitfalls, even though the end rewards can be great.

Dave Brownlee, who was responsible for establishing the operations of Altergo Software in the US, is a man who has travelled that path and who can honestly admit that, although he made mistakes along the way, he now has no regrets as he sees the company beginning to reap the rewards of its US venture.

"When I first came to America early last year to start our US operations, I was over-optimistic about the speed we could grow nationwide," Brownlee recalled. "It is not possible to grow without having the right people to help you grow. As elsewhere in the computer business, talent in the US is in short supply."

It took seven months before Altergo recruited two technical staff to join Brownlee and his two British support staff. And it took longer to find the right sales people. "Since then we have grown through a kind of inner network, with new staff obtained mainly through personal contact."

Brownlee also emphasised two other crucial lessons learnt by Altergo.

"The costs of operation in the US can be phenomenal, so nobody should venture there without sufficient resources; and marketing and technical documentation must be of the highest quality."

Both these points relate directly or indirectly to one of the most important features of the US — its sheer geographical size.

Most phone calls are long distance and many client trips involve large air fares and hotel bills. So it is not practical to have the "hand holding" type of personal support which is common in Europe.

Brownlee said the telephone bill alone can be in the region of $17,000 a month for Altergo. Because of the high expenses, he estimates that each manager costs about $100,000 a year, each salesman about $80,000 and each technical support person about $70,000.

The geographical dispersion has been one of the main factors why the software package industry grew so quickly in the US. Software vendors had to find a way of offering software that could be implemented and maintained with relative ease, and could be as self-sufficient as possible.

Coupled with the lavish way in which the Americans were willing to upgrade hardware, an important side-effect of this has been, according to Brownlee, a trend in US package development towards a "checklist of bells and whistles" approach, rather than aiming at good efficiency and performance, which has been a priority for European software.

This led to important challenges to Altergo's main product, the Shadow II TP monitor for IBM systems.

The need for well packaged software places a stress on documentation. "When we started in the US our documentation, which had been relatively well received in Europe, was only just adequate at best, for the US market," said Brownlee.

"So we invested a great deal of resources in our first few months of operation in the US in improving documentation to a point which I believe makes it the best in the industry."

The American emphasis on the checklist approach to buying software meant that Shadow had to develop a wider range of user-oriented features to catch up with the "bells and whistles" offered by competitors.

But now that Shadow has extended its user checklist, Brownlee believes that the efficiency and design aspects of the product are beginning to get through to users, particularly as the slow growth of the US economy in recent years has begun to put European-style constraints on DP budgets.

As evidence of this acceptance, Brownlee claims that Shadow II is currently selling at a rate of ten a month in the US, which he believes is greater than any other independent supplier of TP monitors. The worldwide user base for Shadow is over 230, with about 90 in the US.

Brownlee likes the frank, no-nonsense approach of the Americans. One of the "big differences" between the US and Europe he cites is the way in which a salesman will waste less time in making first calls on prospective users in the US.

"The US manager will answer frankly questions on the size of the budget and who in the organisation has the final buying power. In Europe, however, the manager often does not know the answer to questions of budget size and likes to pretend that he has the final say, even if he hasn't."

Brownlee points out that the inherently lower cost of software development in the UK means that Altergo Software can afford to have a bigger, higher quality development team based in Britain.

But he is very clearly in the mould of the American manager

BROWNLEE . . . . . "in America, being number one is what is important. Americans always set their targets high and go after them with conviction."

regional sales offices in the US with a total technical staff of over 20, mainly Americans, which Brownlee says will double when the right people are found.

But, besides just the problems of obtaining staff, the sales of Shadow in the US took some time to take flight and many of Altergo's rivals have accused Altergo of using "ungentlemanly conduct" in its initial sales tactics.

"Yes, I am aware of these claims," said Brownlee.

"With only the three of us initially, our first major problem was to establish credibility and we had to find as best we could and cultivate the initial users."

The initial hard work which Brownlee and the staff in the US put in, working "26 hours a day," now seems to be paying dividends. There are eight

when he looks to the future. "In America, being number one is what is important; Americans always set their targets high and go after them with conviction."

The next signpost to the pot of gold which Brownlee is aiming at is his target that Shadow II will account for "almost all" independent IBM TP monitor sales from mid-1980.

The continued growth and prosperity of Altergo's US operations will be a true test of the product claims and market judgments he has made — claims which, so far, it is possible to reverse the usual one way flow of US-to-Europe technological trade.

TREND

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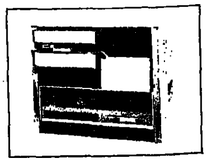

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SOFTWARE FILE -2

EDITED BY PETER HEWITT

Pentagon to fund first kernelised secure OS

THE US Department of Defence is funding the development of the first kernelised secure operating system. The system, for a PDP-11/70, is intended as a model for the future implementation of similar systems by manufacturers.

Called KSOS, Kernelised Secure Operating System, the system will be compatible with Bell Labs' Unix operating system for the PDP-11 and is being developed by Ford Aerospace in Palo Alto, California.

The security kernel itself is likely to be written in Euclid, a language specially designed for constructing provable systems software (Software File, August 10).

The intention of the project, said a Pentagon spokesman, was to demonstrate by developing a working example, that a secure operating system could be built which offered total multi-user multi-level security.

Although Unix and the PDP-11 had been chosen because both are very widely used, it was not intended that this combination should become the standard for secure systems. Instead it was hoped that manufacturers would follow the Pentagon's lead by producing their own secure operating systems.

Subsequently, the Pentagon expected to be able to buy in systems commercially which would meet its security requirements.

These systems, he noted, could be implementations of KSOS on other hardware or could be other operating systems constructed using the same techniques. To facilitate such developments, the Pentagon intended to make KSOS design specifications and technical documentation widely available.

An essential characteristic of kernel routines is that they are rigorously proven, using program verification techniques.

The concept of a kernelised operating system is based on the idea of an inviolable security kernel which supervises every data access. Generally assumed to be a small subset of a complete operating system, the kernel enforces security by acting as a "universal policeman."

An essential characteristic of kernel routines is that they are rigorously proven, using program verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

Ford, which is scheduled to deliver KSOS in September 1979, expects to receive the first version of the Euclid compiler from Toronto in about two months.

However, neither the Pentagon nor Ford Aerospace regards Euclid as an indispensable tool for the development of provable software. Although work on the compiler is understood to be going very well, Concurrent Pascal could be used as the implementation language should the Euclid development be significantly delayed.

Ford began work on KSOS in Spring 1977 and has completed a detailed specification in HDL, a high level hierarchical design langauge. The firm was awarded an implementation contract in May of this year.

Also involved in the project is the Stamford Research Institute, which has been assigned 10 per cent of the work under subcontract. SRI's contribution is a range of automated theorem provers that can be used in the design verification step.

Frank Druding, director of software engineering at Ford Aerospace, noted that while it was hoped to use Euclid for the kernel, much of the remaining software would be be written in the programming language C.

The completed system, he said, could well be portable to other machines, provided that they offered similar hardware protection mechanisms to the PDP-11.

Comradely appeal of real time language, RTL/2 . .

THE continuing appeal of the real time language RTL/2 has been demonstrated by the first sale of the software in an Iron Curtain country.

Ordered from SPL by the Rumanian state trading company Electronum, the software is destined for a major Rumanian research organisation. It will be used primarily in the development of real-time control applications.

The version ordered is for Digital Equipment's PDP-11 minicomputers running under RSX11 and will be supplied together with SPL's run-time support routines, MTS.

An SPL spokesman noted that the sale was particularly significant in that the language had been chosen entirely on its own merits, without regard to political considerations.

Users, he said were increasingly concerned over software portability. In this context, the "frozen" standard for TRL/2, which meant that all implementations were consistent, was a strong feature. In addition, the language benefited from being fairly modern.

In these respects, he added, RTL/2 already met the requirements set by the Pentagon for its new real time language to the "Steelman" specification.

SPL sees the Rumanian RTL/2 order as a foothold for expansion into other Iron Curtain countries, from many of which it has received enquiries in the last six months.

● SPL is developing a portable compiler for RTL/2 which will enable to run on any microprocessor, see page 9.

ADP profits up

A TURNOVER of $299 million and net profits of $27.4 million were chalked up by Automatic Data Processing in its last financial year which ended on June 30. Turnover and net profits were up by nearly 22% and 18% respectively on the previous year. ADP is represented in Europe by ADP Network Services.

PROGRAMMER NOTES

Too many skeletons in the cupboard

ACCORDING to the surfers' chronicle, the Los Angeles Times: "The boom in computer jobs will fizzle in the 21st Century. The supercomputers will program and repair themselves."

This shock-horror revelation was made in the LA Times in the course of a long article on that well worn topic, the impact of computer-type technology on the future of work.

Other than a big picture of a femacho blonde gun-toting cop to emphasise the changing role of women in work, the article covered all the ground that has been so frequently discussed in places like Computer Weekly, not to mention the TUC Congress (CW, September 7).

For the professional programmer, the prospect of the current sea of vacancies turning to a drought at about the same time as their hair turns grey is unlikely to be the most pressing problem of the day.

But before dismissing the thought, it is worth contemplating the following.

While programmers today are part of cocooned elite, there are forces at work outside threatening the pence.

For a start, the mass of "amateur" programmers are showing the fabric of the "programmers' expertise" often has as much substance as the emperors' new clothes. US hobbyist magazines now give away Basic compilers for free and school children develop sophisticated systems software.

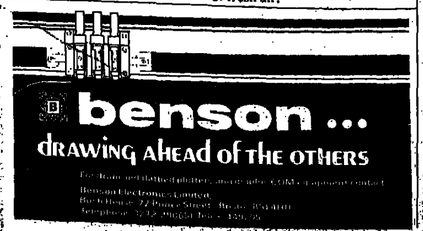
As was highlighted by speakers from semiconductor manufacturers at the National Computing Conference in sunny California (CW, June 8), the inefficiencies and instability of software production are the greatest obstacles facing the growth of semiconductor manufacturers who are used to reliable engineering methods.

Despairing of human software developers, Bob Heikes of Motorola suggested that the only long-term hope for the production of reliable, efficient software would be by using artificial intelligence techniques. And he wasn't joking.

But the ground on which programmers stand may not be as secure as it seems. There are too many horrendous skeletons in the software cupboard, trembling at the thought of a breath of fresh air.

Puzzler

FACTORIAL 19 has 18 digits, the last 17 being 21,645,100,408,832,000. What is the first digit? (No calculators allowed — and par solving time is only 3 minutes!) See page 62 for solution.



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HINT OF THE WEEK

Aligning stationery with sticky labels

THE alignment of pre-printed stationery on the ICL 1933 printer is the topic of a hint sent by David Leigh, an operator at the Manchester site of Covered Cables Ltd.

He says, "Quite often, the operator will spend a lot of time ensuring that the line-up of the stationery is correct.

"Vertical alignment is no problem, because on the left-hand side of the back-plate there is a series of numbers which act as reference points.

"However, horizontal alignment is a different matter, because there is no way of knowing whether the paper is too far to the left or right."

According to Leigh, this problem may be overcome by the use of sticky labels.

He continues, "You can save a lot of time and effort by putting a label on the backplate of the printer so that its top left-hand corner coincides with that of the form being aligned."

To get the label in the correct position, reverse the process just described — align the form by means of trial and error, and then attach the label to the backplate of the printer accordingly.

I would like to add another tip relating to the line-up of stationery: when the printer runs short of paper in the middle of producing a listing, simply overlap the first form of the new box-load with the one still on the carriage of the unit — this ensures that the alignment is right and saves a lot of time.

● A number of operators have expressed reluctance at submitting hints to Op Spot, because they believe that if they know certain "tricks of the trade" then everyone else will be as well-informed. That is not the case. From my own experience, and from talking to a number of contractors, it is clear that some sites are far more technically aware than others. And remember that the hints will be of considerable use to trainees.

Coming out TOPS through Control Data

MANY persons looking to enter the field of computer operations (or any of the other computing disciplines, for that matter) have only a vague notion of what the work entails and the opportunities that are available.

They might well apply for jobs through the various agencies and, as a result of their keenness and lack of awareness, accept the first position offered to them.

However, there is an alternative method which gives budding operators practical and theoretical training and the chance to visit two sites as a part of their course.

This is the Manpower Service Commission's Training Opportunities Scheme (TOPS) which provides computing courses in London and throughout the rest of the country.

The MSC comprises an employment services division and training services division: the former, with its job centres and employment offices, is responsible for attracting potential students; and the latter arranges for courses to be run by colleges and companies.

One such company is Control Data Institute, which provides TOPS courses for operators at its training centres in Birmingham, Manchester, Leeds and London. New centres are to be opened at Bristol and Nottingham during September and October respectively.

The CDI operator courses are for persons between the age of 19 and 28 years. Their purpose is to train the students to the level of junior operator with a view to placing them with companies.

The candidates go through a stringent selection process: they attempt a written test and, if successful, go on to an interview. A pretty low percentage actually get through both stages.

"The written selection tests are not to see what aptitudes they have, but to find out whether they have the natural skills necessary to cope with the training. Of those who come along, about 23% actually get through this stage," said Michael O'Connor, sales and services manager at CDI.

The interview is equally strict, as he explained: "During the interview we look to see if they have personality and motivation necessary to make a good operator or programmer. Whether they are sent on the programming or operations course depends upon personality, and not how well they have done in the written test.

"It works out that about nine out of every 100 actually get through both stages of the selection."

According to O'Connor, CDI has had a considerable rate of success since it started holding TOPS courses at the end of 1976.

"Between January of last year and July of this, about 180 of our students successfully completed the operations course and have been placed with companies as junior operators," he said.

From 17 who graduated from a course at the Manchester centre on May 29, 15 were placed with firms within six weeks. Of the two not working as operators, O'Connor said, "One is in hospital and the other went off to Holland, I think."

The record of a course at the Birmingham centre is even better, according to O'Connor.

"That course, which was completed on July 31, had a 100% pass rate. They have all since been employed by companies."

CDI plans to modify the operations course so that the students are given more individual tuition, as opposed to being considered part of a group.

"At the end of the year, we are to reduce the number we take on every six weeks from between 15 and 20, to 10. This will enable us to follow each individual's progress more closely," siad O'Connor.

Despite this, the content of the operations course is to remain the same. It includes an appreciation of general DP topics; training in both IBM and ICL hardware and software; and two periods (both two weeks long) when the students attend an ICL and an IBM site in order to work as part of an operations team.

These site visits fit in with the rest of the course in a logical manner; after they have studied the ICL hardware and software, they go to a site using that equipment. The same applies to the IBM section.

According to Chris Thorpe, who is regional instruction manager for the CDI centres outside London, the practical side of the training is extremely valuable in placing students when they finish the course.

He said, "The site visits provide an excellent opportunity for the student and the company concerned to take a good look at each other and to see if they are suitable."

But even if the student has the opportunity to join the company as soon as he has completed the visit, CDI still advises him to complete the course.

Said Thorpe, "we wouldn't encourage anyone to drop out of the course at that point. For example, after the two-week period at the ICL installation comes the training on IBM equipment, which in turn is followed by two weeks at an IBM installation."

He then went on to describe the usual way in which CDI finds jobs for its students.

"Each regional office has a training services officer who is responsible for recruiting students and finding them positions with companies. He works closely with the training instructor and together they study each student's progress, strengths and weaknesses.

"Of course, the training services officer is in direct contact with the companies, and so he knows exactly the sort of person each one is looking for."

He continued, "The companies get an excellent deal because the whole thing doesn't cost them a penny." In addition to this, they are able to see how the student has performed on the course.

Thorpe concluded, "Each student has a report card which is shown to the prospective employee. Recorded on it are the student's marks on each topic covered and the remarks of the lecturer concerned."

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

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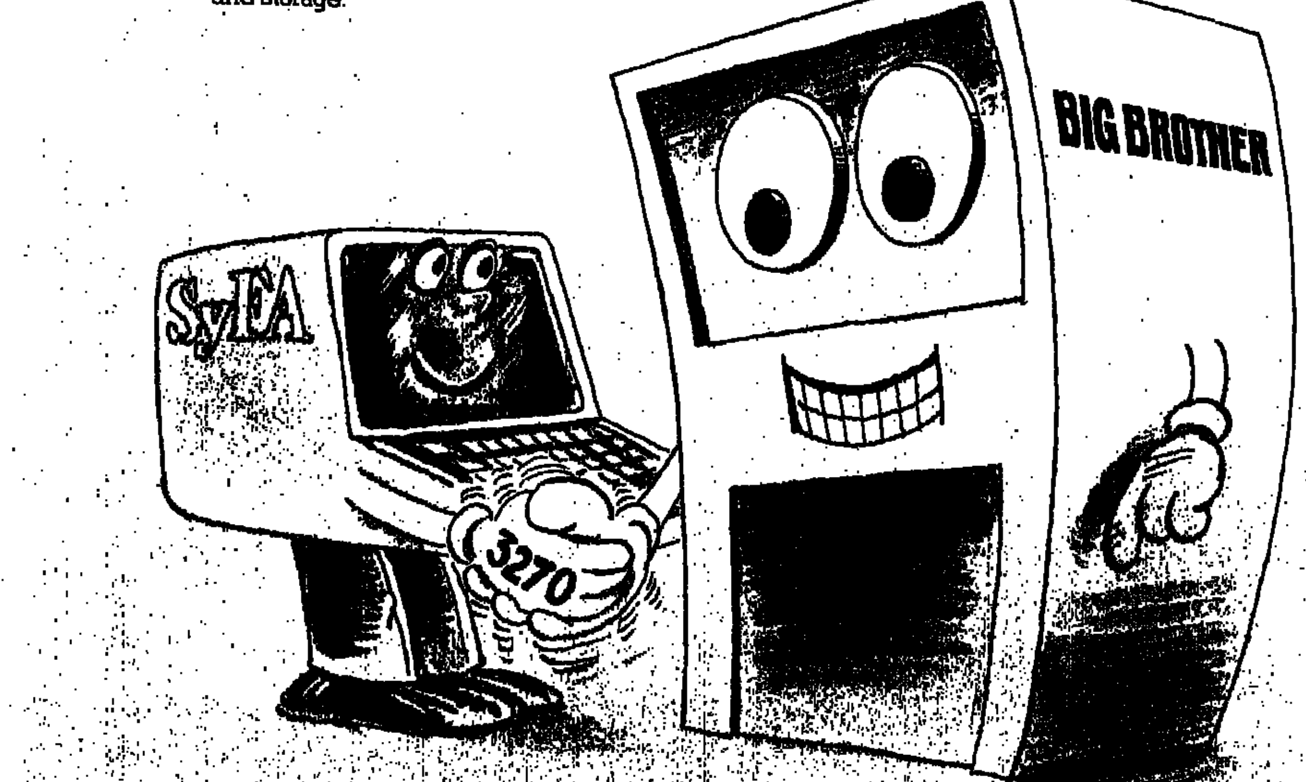

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Pilot and computer link-up for fail-safe flying

THE complexity of modern fighter air-cract is so high that it will shortly become impossible for pilots to fly them without substantial support from computer and associated electronic equipment.

The problem, however, is to find the best method of transferring data at high speeds into a pilot's brain and checking that all parts of the message have been recognised.

Highlighting research he has done on this problem, Carl Sem-Jacobsen, of the EEG Research Institute in Oslo, gave a talk on brain/computer communication at the International Congress of Aerospace Medicine last week.

"Information about man's ability to adapt to changing environments and data on his requirements in such situations is of paramount importance for present day and future aviation and space travel," he said.

Sem-Jacobsen has been carrying out tests on US Air Force pilots since 1958, and his studies have concentrated on the change in brain waves that signify that a particular piece of information has been received and understood; referred to as an "evoked response." Recording of these changes is achieved by attaching electrodes to pilots scalps and using a computer to process the resulting data.

A scenario for the cockpit of the future, he suggests, is that all instruments will be replaced by a VDU screen. The on-board computer would then be able to flash information to the pilot via this or provide it aurally by means of coded signals.

"This information will be given either on the request of the pilot or when information monitored by the computer reaches a threshold point, and the pilot should be alerted," said Sem-Jacobsen.

Safeguards would have to be built in so that if the pilot did not take full account of the data, the system would inhibit him from making a wrong and possibly catastrophic decision.

"An example could be like this," added Sem-Jacobsen. "The computer gives the pilot 10 different sets of information in sequence, but the busy pilot overlooks four of them. When the pilot wants to take action on the basis of only six sets, the computer will freeze the controls and flash something like — reconsider, you did not take into consideration these four sets of information which must be considered. The computer then repeats the four unrecognised sets."

Currently, Sem-Jacobsen is conducting similar experiments with North Sea divers who operate submersibles.

"I have used a microprocessor-based system to record and process details of divers' brain wave activity while they carry out work in the North Sea," he said. "Electrodes are attached to their scalps as with the pilots and information is relayed to the surface via a special cable in the submersible's umbilical."

Storm over NEB's sale of Ferranti equity

A COMPLAINT that trade unions were not consulted over the sale of the National Enterprise Board's one-fifth shareholding in Ferranti has been made by Tim Webb, national officer for ASTMS.

Webb's main point is that: "... in 1974 when the company got into trouble, the unions were involved in the rescue operations through tri-partite involvement, along with the Government and the company. Now that the company has recovered, the unions are not consulted on a fundamental decision."

Further discussion involving Ferranti and the Confederation of Shipbuilding and Engineering Unions, to which ASTMS is affiliated, has been called for by the union on the reconstruction of the company and the sale of the NEB shares.

Swift software

SOFTWARE to enable banks to connect to the Swift international funds transfer network has been developed for the Level 6 minicomputer by CII-Honeywell Bull in France.

SPL announces RTL/2 on micros

A COMPILER development underway at SPL will make possible low-cost implementation of the real-time language RTL/2 on any microprocessor. When complete, the software will, in effect, ensure the portability of RTL/2 programs across the entire range of microprocessors.

As in CAP's portable MicroCobol, the SPL system will be based on an intermediate language interpreted at run-time on the target computer.

A new RTL/2 compiler is being written to generate this intermediate language, called by the company R-code. User programs, compiled into R-code, will be capable of running on any microprocessor for which an R-code interpreter exists.

Such an interpreter, a small program which is written in the host machine's assembly language, can be developed for a new machine in a few months, says the company, rather than the year or more currently required for developing a complete compiler.

The new compiler, written in RTL/2, is scheduled for the first quarter of 1979 and will run on any of the 12 machine ranges which currently support the language.

Scheduled for release at the same time is the first R-code interpreter. Although SPL would not identify the microprocessor involved, a spokesman said that "it won't be a surprise" — inevitably, implying the ubiquitous Intel 8080.

An interesting possibility raised by the new software is that of further minicomputer implementations of RTL/2. While denying such plans, a spokesman admitted that the approach could offer a very low-cost route to providing RTL/2 on any hardware.

One snag, however, outside the microcomputer environment, could be the time penalties of interpretation. The company currently estimates that "portable" RTL/2 will run about five times slower than the equivalent program in machine code.

Aimed particularly at the OEM market, the new system joins two existing RTL/2 compilers for microprocessors: SPL's implementation for the DEC LSI-11 and that under development by Software Sciences for the Texas Instruments 9900 (CW, December 8, 1977).

Motorola launches three-chip CMOS-based codec set

An all-CMOS codec set has been introduced by Motorola to win a share of the booming telecommunications market. A codec encodes and decodes audio signals for digital transmission.

The three-chip set consists of a companding codec chip which is available now, backed by a filter chip and a linear device that replaces the hybrid transformer normally required in another analogue to digital conversion equipment. The last two will be available early next year.

This codec set is the first to use the CMOS approach. CMOS offers considerable advantages in terms of power consumption and power supply tolerance which could be important in some telecommunications applications.

'Register engineers', says union

A CALL has been made by the 430,000 strong electrician's and plumber's union, the EETPU, for the statutory registration of professional engineers.

The call, which will affect computer engineers if accepted, was made on the recommendation of the EESA section of the EETPU, which has given evidence to the Finneston Inquiry on the engineering profession.

Major points contained in the evidence are that: the number of engineering institutions should be reduced; a central registration council with representation of the Government, the CBI, the TUC and prescribing institutions should be established; and that it is necessary to achieve a harmonisation of engineering standards among EEC countries.

Access control unit launched

AN ADDITION to its range of security access control units has been announced by Cardkey Systems, the UK Subsidiary of Cardkey Systems Inc, a part of Greer Hydraulics Inc, of the US.

Called the Cardkey Interrogator 770, it is intended for use at industrial and commercial premises which have between 50 and 1,500 staff. It supports up to 16 terminals, or card readers, which may be placed as far as one and a half miles from the controller.

Each employee is given a "Securiti-Card" to determine the areas he may have access to and at what particular times.

The controller produces a printout of statistics and a magnetic tape interface is avilable so that the data can be used for mainframe applications such as the payroll.

IEE on computer crime

A SIX-SECTION biography on computer crime* has been published by the Institution of Electrical Engineers. It includes over 70 references to relevant literature which cover the general problem, fraud and embezzlement, physical security, legal aspects and insurance, privacy and protection.

*The new criminals: a bibliography of computer related crime. £4.25. IEE Sales Department, Nightingale House, Hitchin.

UK production of Pets soon

PRODUCTION of Commodore Pet microcomputers will start in the UK before the end of this month.

The company's Eaglescliffe, Cleveland plant which has been producing Commodore calculators will assemble 500 Pets a month, rising to 1,000 a month by December.

Commodore has sold over 1,500 of the £695 microcomputer in the UK to universities, schools, research establishments and businesses as well as to personal users.

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IBM [illegible]		[illegible]	[illegible]	
IBM [illegible]		[illegible]	[illegible]	[illegible]
Olympia [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Diablo [illegible] Diamond I				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DIGITAL WORD PROCESSOR				
WS78 Dual Floppy, VDU, Printer	[illegible]	[illegible]	[illegible]	[illegible]
WS200 4 Floppy Discs, 2 VDUs, Printer	[illegible]		795	[illegible]
DIGITAL MINI-COMPUTERS				
PDP 11V03		505	378	315
PDP 11O3		1104	828	690
PDP 1103 DL Club		794	596	497
HEWLETT PACKARD DESK TOP COMPUTERS				
9845S		1160	870	725
9831A		415	311	259
9830		413	260	217
9825		339	269	223
9815A		213	160	133
9810A		339	271	226
9862A X-Y Plotter		221	162	135
9866B Printer		216	162	135
9871A Printer/Plotter		240	180	150
9872A 4 Pen X-Y Plotter		288	216	180
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9885M Flexible Disc Drive Master		221	165	139
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5100		528	484	382
5103 Printer		130	120	108
TEKTRONIX GRAPHIC COMPUTING SYSTEM				
4051		354	265	221
4631 Hard Copy Unit		255	191	160
4662 X Y Plotter		242	182	151
4956 Graphic Tablet		445	334	279
MICRO-PROCESSOR DEVELOPMENT SYSTEMS				
Motorola		490	368	306
Tektronix 8002		573	407	339
DIGITAL TERMINALS				
LA36 Decwriter 11-20M/A Current Loop	885	77	57	47
LA36 Decwriter 11 GPO Interface	935	79	59	49
VT52 Decscope — either 20M/A or V24	1069	86	64	54
LS120	1985	159	119	99
LA180 Serial	1842	150	111	93
LA180 Parallel	1599	129	96	80
DIABLO				
1620 [illegible]	[illegible]	[illegible]	[illegible]	117
1641	[illegible]	216	[illegible]	[illegible]
HEWLETT PACKARD TERMINALS				
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LEAR SIEGLER				
ADM 3A	[illegible]	[illegible]	[illegible]	[illegible]
NEWBURY				
[illegible]	[illegible]			
TELETYPE 43				
TEXAS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
742	[illegible]	[illegible]	[illegible]	[illegible]
743 KSR	[illegible]	[illegible]	[illegible]	[illegible]
745 Portable	[illegible]	[illegible]	[illegible]	[illegible]
770 1	[illegible]	[illegible]	240	180
810 Printer	1650	[illegible]	[illegible]	75
TEKTRONIX GRAPHIC DISPLAY TERMINALS				
4006-1		182	136	114
4010 1		[illegible]	221	184
4012		385	288	240
4013 ASCII/APL		415	311	259
4014-1		691	519	432
4015 1 ASCII/APL		754	565	471
4631 Hard Copy Unit		255	191	160
4662 X-Y Plotter		242	182	151
4954 Graphic Tablet		315	236	197
4024		186	140	117
4025		223	168	140
TRANSDATA				
312 KSR	1210	96	72	60
312 Reader/Punch Unit	1210	96	72	60
305 Portable Terminal	1360	120	90	68
PAPER TAPE/PUNCH READER				
Transdata 308	1360	110	83	69
Midlectron M22	975	77	58	48
MAGNETIC TAPE CASSETTE UNITS				
Techtran 8400-Single Cassette	1210	97	73	61
Techtran 8421 Dual Cassette	1578	126	95	79
Techtran 815-Single Cassette	875	77	58	48
FLOPPY DISC				
Transdata 309	2300	185	138	115
ACOUSTIC COUPLER				
Transdata 307	185	15	12	10
Mod Tech Mini Modem	180	15	12	10
PLOTTERS				
Calcomp 836	[illegible]	380	285	238
Houston DP1	[illegible]	202	151	126
Houston DP3	[illegible]	293	220	183
Hewlett Packard 7203	[illegible]	256	192	160
Hewlett Packard 7221A	[illegible]	245	184	154

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Management game chief

THE newly elected chairman of the members' regional committee of the National Computing Centre is Brian Byers, ICL's Northern Ireland manager. Byers (left) was congratulated on his appointment by Alderman D. Cooke, Lord Mayor of Belfast, at the finals of the Irish Management Game.

The Irish Management Game is sponsored by four companies including ICL.

Control Data appoints three more to the board

THREE new appointments to the board of directors have been announced by Control Data. One is **Richard Anderson**, UK finance and administration manager. Previously financial controller, he joined the company in 75. Another is **Alan Gill**, he is plant manager of the magnetic media manufacturing division of Control Data, based in Brynmawr, South Wales. Gill joined the company in 77. The third one is **Mike McLagan**, he joined the company in 70 and is managing director of Control Dataset the Letchworth-based business products division of Control Data. Before joining Control Data in UK, McLagan has previously spent 11 years with the company in Canada.

Jenson Computer Systems of Bristol has taken on three young people in trainee/junior positions. **Richard Gregory**, who was doing statistical work as a programmer with the Cardiff Health Authority, has joined the company as a junior programmer. He is on a two-year sabbatical from his degree course in Applied Science at the New South Wales Institute of Technology, Australia.

Jerry Locke has also joined Jenson as a trainee programmer. He was studying for his BA in systems analysis at the Bristol Polytechnic. Also to join the company as a junior programmer is **Mohammed Shariff.** He has an HND in computer studies from Derby College of Technology.

Stu Peters has been appointed by Teradyne, a company which manufacturers test equipment for electronic components, as director of European Operations, based at Weybridge, Surrey. Since 73, he has been director of Far East Operations of the company's Tokyo-based Japanese subsidiary.

Stephan Stewert and **Raoul Wynn** have been appointed to the board of directors of Data and Research Services, of Milton Keynes. They have been with the company since 72 and 75 respectively. While one vacancy was created by the departure of the US company Westinghouse as a shareholder in DRS, the other vacancy was created by the death of Professor Lindquist, one of the founders of the company.

Banstead King Parry Williams

ITT Business Systems UK has made three senior appointments, all from within the group. **John King**, who was marketing director, has been posted to Brussels as European director of business and market development of the ITT Business Systems and Communications Group. Succeeding him as marketing director is **Peter Banstead**, who has been marketing manager of the Group since 77. The third appointment is that of **Geoffrey Meadowcroft**, formerly general sales manager since 77, he moves to become head of the Group's Data Systems Division, at Cockfosters.

Bob Sarah, appointed marketing manager at Software Development Services, was previously Western district customer engineering manager at Hewlett Packard.

Michael James, who was previously with Digital Equipment Corp, Reading has joined Pertec International, Reading, part of the Pertec Computer Corp, to operate as inside sales support. Also to join the company is, **Ronald Bowers**, as training instructor. He was previously with EMI (Medical), Slough, as engineering training officer.

James Williams has been appointed vice-president of planning and control at Itel International's London HQ. He will have responsibility for the company's financial operations. He succeeds Ronald Coelyn, who returns to the US to become vice-president, finance of the Itel data services group. Williams was previously vice-president finance and administration of the field engineering division in the UK. **Hugh Parry**, who was previously finance director of Telex Computer Products in the UK, has been director of country finance and administration with Itel International.

Martin Cardozo, a past chairman of the European Management Association, has joined Digico as sales consultant in the distribution and OEM Division. He was previously with Binder Hamlyn Fry & Co as administration manager.

Chris Boon, previously managing director of Infotech International, becomes MD of a new company Infotech Europa, which is based in Holland and will establish other subsidiaries in Europe. Chris Bunyan, who was formerly responsible for special events, becomes [illegible] of Infotech International. [illegible] Bates, who assumes responsibility for special events, Stewart Adki[illegible] head of the training division and John Spencer, head of the publications division, have been made board directors.

Earl Wantland has been appointed to the board of Floating Point Systems of Portland, Oregon. He is the president and chief executive officer of Tektronix.

DIARY

SEPTEMBER 18-22
Jackson design technique, workshop Marcus Bromberger, Dept of Computer Science, University of Strathclyde, Glasgow. 9.30. Details from the Continuing Education Office at the University, tel 041 552 4400, ext 2137

SEPTEMBER 19
Getting cost control accepted, seminar Association of Project Managers, Association of Cost Engineers. Beltrs Hotel, **Manchester.** Details: M H Drake, 061-228 2011

Performance evaluation. Prof P Samet BCS, Reading branch. Copper Inn, **Pangbourne.** 20.00.

SEPTEMBER 19-21
CAD/CAM, computer aided design and manufacturing conference and exhibition. Computer and Automated Systems Association. **Los Angeles.**

SEPTEMBER 20
VME/K subgroup meeting 2900 User Group. National Liberal Club, London SW1. 10.30.

Micro software, Dick Waller. DPMA Essex branch. County Hotel, Rainsford Road, **Chelmsford.** 20.00.

SEPTEMBER 20-21
Local Authorities Group meeting. IBM Computer Users' Association Central Regional Council, **Stirling.** Details Mrs Speciale, 01 551 1643.

SEPTEMBER 21
Telecommunications – convergence of technologies, Derek Broome, BCS London branch, Waldorf Hotel, Aldwych, **London,** WC2. 18.00.

Colloquium on the use of microprocessor based systems in manufacturing and processing industries. IEE, Savoy Place, **London** WC2, 10.30 Details tel 240 1871 ext 280.

SEPTEMBER 21-22
Seminar on cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America. Hotel Russell, **London** WC2. Details, tel 01-242 4045.

SEPTEMBER 21-23
Symposium on interactive techniques in computer-aided design. IEEE Computer Society **Bologna, Italy.**

SEPTEMBER 25-28
ISATA 78, automotive technology and automation symposium. ISATA Committee, European motor industry. Congress Centre, **Wolfsburg, W. Germany.**

SEPTEMBER 26
Colloquium on the industrial uses of image processing. IEE Savoy Place, London WC2. 10.30. Details, tel 240 1871 ext 280.

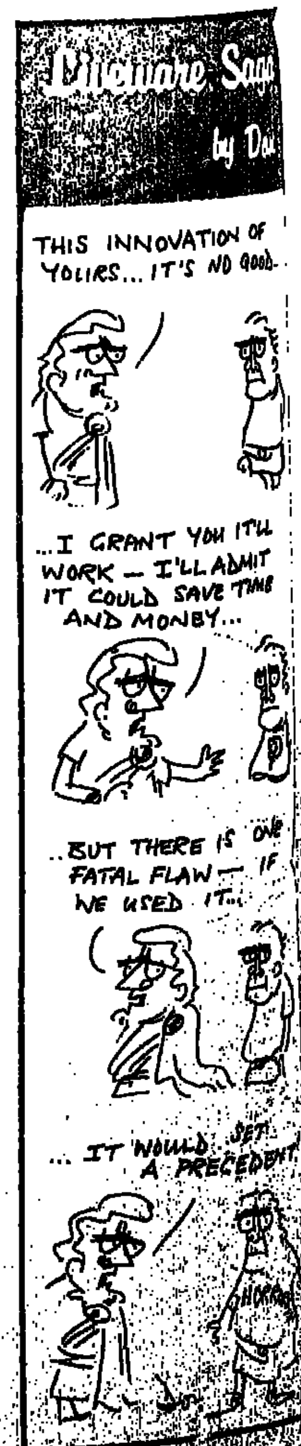
SEPTEMBER 26-28
Seminar cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America. Sheraton Hotel, **Brussels.** Details, tel 01-242 4045.

SEPTEMBER 26-29
International computer communication conference. ICCC 78. International Council for Computer Communication. **Kyoto, Japan.**

SEPTEMBER 27
Intelligent terminals in information retrieval. BCS Information Retrieval Group. **London.**

SEPEMBER 27-28
Management Group meeting. IBM Computer Users' Association. Mount Royal Hotel, **London** W1. Details Mrs Speciale, 01-551 1643.

SEPTEMBER 28
Colloquium on computer aids to software production. IEE, Savoy Place London WC2. 10.30. Details, tel 240 1871 ext 280.



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Pepe Piedra (European Marketing Director of Zilog)

2. Products to solve systems problems
Current and new products, including cartridge discs, drives and integrated intelligent terminals to suit a variety of packaging requirements.
John Lythall and Jim Coupland (Cramer Microsystems) and Peter Beckett (European Technical Manager, Zilog)

(LUNCH)

3. Software tools for the company that knows the software business
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John Lythall (Cramer)
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(TEA)

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Steve Kirk (Software Architects Ltd)

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Inmos reaction to 64K RAM from TI

THE announcement of a 64K dynamic RAM by Texas Instruments last week does not mean that the UK's Inmos has missed the boat, even though the National Enterprise Board-backed firm is unlikely to have such a device on the market before 1981. This is the view of Inmos deputy managing director, Dr Paul Shroeder, who pointed out that the 4K and 16K devices developed by his former employer, Mostek, were both late in the field but still became industry standards.

One of the major features of the TI device, the TMS 4164, is that it is the first 64K dynamic RAM to be announced with a single 5-volt power supply. A 64K device announced earlier by Fujitsu requires two power supplies with different voltages, +7 volts and −2 volts. TI points out that its single supply chip offers considerably lower power dissipation and is more immune to system noise. TI adds that the chip's compact layout for 5-volt only operation results in improved performance.

Performance figures for the TMS 4164 include access times ranging from 100 to 150 nanoseconds with minimum cycle times of 200 to 250 nanoseconds. TI says that sample quantitities of the device will be available in the fourth quarter of this year and that volume production is scheduled for the first quarter of 1979.

On the question of whether Inmos will go ahead with the development of a 64K dynamic RAM, Dr Shroeder said that no definite commitment has been made yet, but that it was being given very serious consideration. It was a product that any company in the Very Large Scale Integration business should consider making.

TI expects that 64K RAMs will account for more than a quarter of the billion-dollar MOS memory market in the early 1980s, and the firm's UK managing director, Robb Wilmot predicts that worldwide production of 64K devices will have already reached the 20 million units a year level by 1981, while the cost per device will have fallen by then to £4. At present 64K devices cost about £80 each.

TI has no plans as yet to fabricate or even assemble 64K devices in the UK. Its Plymouth factory, where most of its UK manufacturing is now concentrated, assembles 4K and 16K devices from wafers fabricated in the US.

The only firm at the moment definitely intending to fabricate 64K devices in the UK is ITT Semiconductors, and although it has not been announced yet the ITT product looks like being a single 5-volt supply device (CW, August 3).

Silent 700 beats big drum for North-east

THE job of attracting new industry to the North-east of England has been simplified by the use of a system called Competer, which has been developed and is used by the Peterlee Development Corporation.

PDC officers now carry a portable Texas Instruments Silent 700 terminal whenever they go overseas to meet industrialists interested in locating a factory in Peterlee.

The terminal can be connected to any office telephone in any country and answer industrialists' questions about the incentives his project will attract, an assessment of his project's long-term viability, information on his ideal location and a range of up-to-date figures on employee and factory availability.

The worldwide capability of the system is made possible by using the Comshare time sharing network.

"The program was not easy to draw up," said Fred McClenaghan, PDC's assistant director for industry. "It involves many variables, but the Peterlee industrial team is now operating it very smoothly and we have drawn up a number of additional programs to develop the system further as a sales aid."

Previously, only general examples or incomplete answers could be given.

"Already, a number of industrialists visiting us have had Competer demonstrated to them on their own individual projects," added McClenaghan, "and they have been very impressed."

Tanzanian order

TANZANIA'S Posts and Telecommunications Administration has ordered a computer-controlled telex switching system from Fujitsu.

The Fedex-100 system is due to be in operation in Dar-es-Salaam by March 1980 with 1,160 exchange lines, and the £835,000 contract includes equipment, installation, maintenance and employee training.

Information systems user group

AT last there is an opportunity for online users in the North West to get together without the expense of a London trip. A Manchester user group has now been formed for new and potential users of international information systems.

The main aim is for users to meet to exchange information and experience, although speakers and visits will also be included in the program. The first meeting is on September 20 in Room B3 of the Maths and Social Science Building, UMIST, Sackville Street, Manchester.

Experienced users from ICL and Unilever will discuss the pros and cons of the different systems as a prelude to a general discussion on the use of online systems. A full programme has been arranged into 1979. Contact the secretary, Mrs Rangeley, Medical School Library, Manchester University or the chairman, Dr P. W. Williams, Computation Dept, UMIST, PO Box 88, Manchester M60 1QD.

Turnkey systems for news wholesalers

USING experience gained in developing and operating its Newspac bureau service, Gamma Associates, the Nottingham-based systems group has introduced News-Key, a range of turnkey systems for wholesale newsagents.

Gamma also announced that the first order for a News-Key machine, a News-Key 1, has been placed by W. Knight of Northampton.

Based on Digital Equipment Datasystem hardware, News-Key comes in three basic models, all of which can be tailored to individual user's requirements.

About four years ago, Gamma added its Newspac system to its range of services and now has 14 wholesale newsagents subscribing to it.

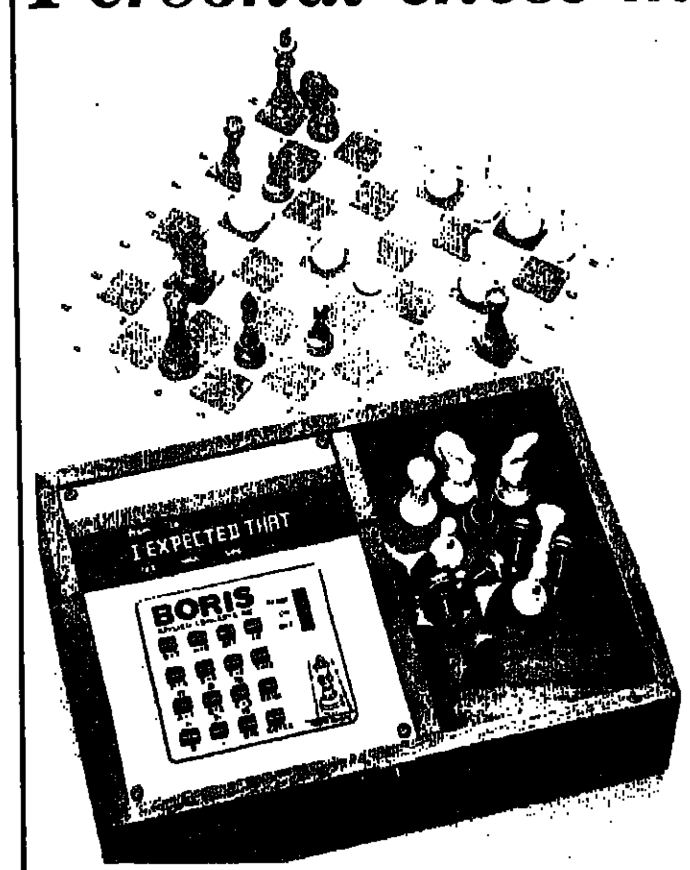
However, it was felt that there was demand for a standalone system that could be operated in-house by a wholesale newsagent. He could then determine the best time for processing data, printing out invoices, or other sales details.

The type of information contained in the News-Key database is details of customers, orders, publishers, and publications, and the mix of such information is entirely up to the user.

A typical News-Key 1 system can include a DEC Datasystem 320 processor with 64K main memory, two 5 Mbyte disc drives, a 300 lpm printer and two VDUs, However, up to four VDUs can be supported by the system. Eight terminals can be supported by News-Key 2, and 32 on the News-Key 3.

Cost of the systems ranges from £22,928 to £38,508.

Personal chess move...



The Boris personal chess computer — a different game each time.

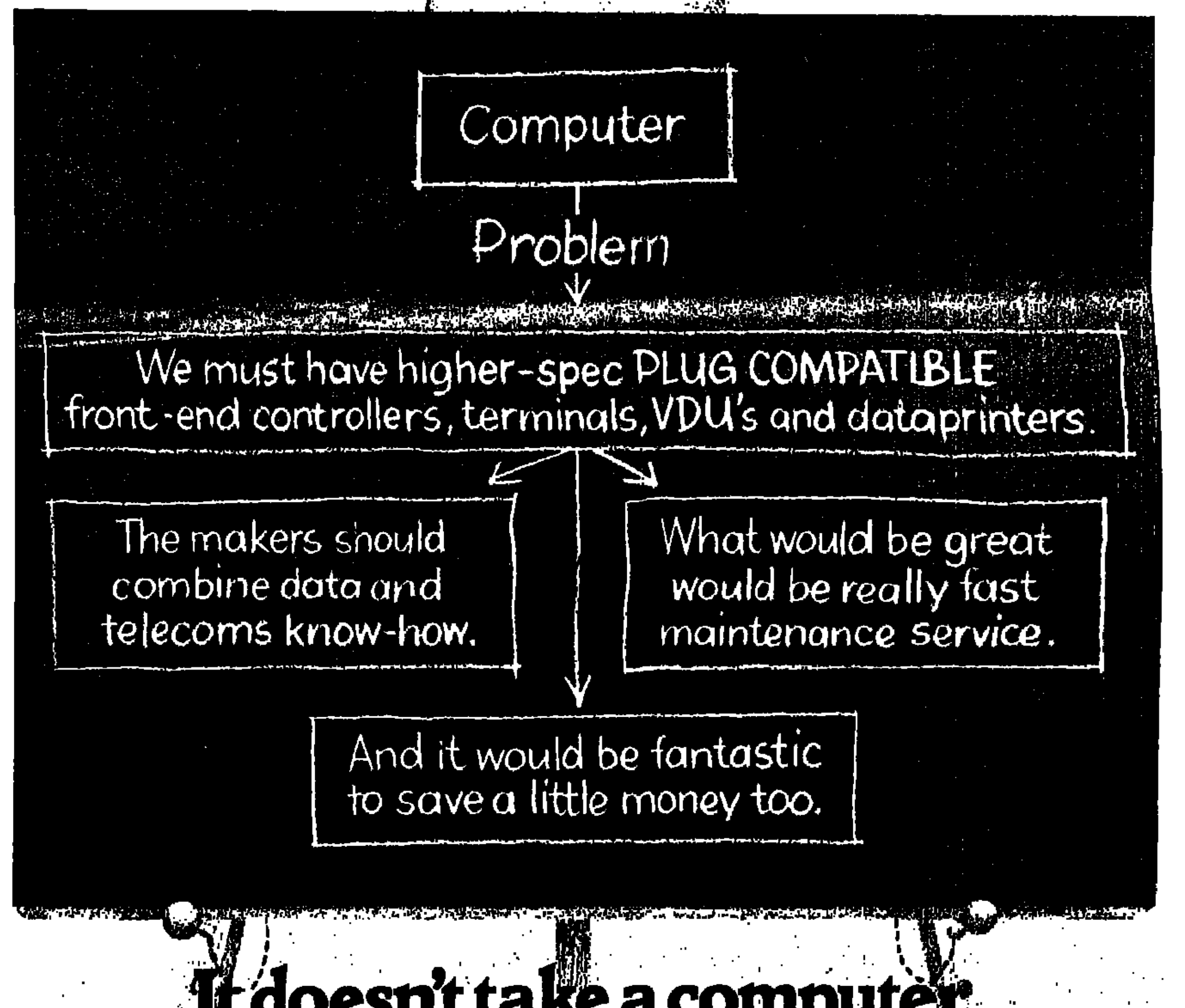
International marketing rights for a personal chess computer called Boris have been awarded to the Washington Executive Group in Washington DC.

Produced by Chafitz, of Rockville, Maryland, Boris is based on the Fairchild F8 microprocessor and is programmed for all classic chess moves, including castling, en passant, and queening. It is also programmed for random play, so that the beginner or experienced player will not get the same game twice.

Boris is portable and comes in a walnut case (25 x 8 x 16cm), which encloses a compact chess board and a set of chess pieces, but the player can use his own board and pieces.

Alphanumeric messages are displayed to signify moves or tell the user which colour Boris will play. It can also display chatty phrases.

The cost of the system in the US is $300, but it is likely to sell for £199 in the UK. It will be available from normal retail outlets. The UK distribution agent is Optimisation, of Bishop's Stortford.



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(See Computer Weekly 7 Nov 74, Computer Management Feb 75, etc.)

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LETTERS TO THE EDITOR

Computers 'not nearly independent enough'

THE virtues of a free, uncensored Press, with access by all shades of opinion, are well illustrated by your issue of August 31. I refer to the differing views on human-like aspects of computers, and their effects on the future of mankind, from Donald Michie and Christopher Hodder Williams.

Professor Michie is afraid of computers getting too inscrutable and will hence make mankind irrelevant, whereas Mr Hodder Williams thinks that human-like computers will take over just because they are human-like. Undoubtedly, Mr Hodder Williams has a point.

In evolutionary theory, which is not restricted to biochemical beings, two competing organisms cannot occupy the same ecological niche for any length of time; hence in the intellectual environment, sufficiently human-like computers will either displace mankind, or die out, or adapt — to inscrutability? But Mr Hodder Williams is surely being a bit alarmist — computers are just not nearly independent enough, nor will be for a long time, for this to matter.

On a more practical level, one wonders what we need human-like computers for: we have 5 billion already and they (we) can hardly all be fed properly as it is. To err is human; we need something different to help us.

Professor Michie also has a point when he says that unhuman-like computers will have goals not ours. Perhaps a partial solution can be found by building in something like Asimov's Three Laws of Robotics so that the computers will always have to take us into account. These laws would have to be built into the deep structure of the computers, so that they cannot be changed without the whole system collapsing, just as all living things have the same DNA/protein system.

As I have indicated before, not only by mankind and computers differing, that both can survive.

I am not too bothered by the idea of computers having an autonomous existence over rather than under us. After all Christian theologians have not had any difficulty in accepting the idea of free-will and dignified, meaningful lives for men under an omniscient God.

C. G. BREINDL

Haywards Heath, Sussex.

Plea for a more human face

INSOFAR as I understand "Cognitive Horizons" (Michie's Privateview, August 31) it appeared to be some kind of plea to give computing a more human face in the eyes of the public.

I say "insofar as I understand" because his article contained many of the awful lumps of mind-numbing jargon which computer people — along with sociologists — feel they have to use in order to impress people.

Receptor and effector organs . . . Megasystems heuristics and inference procedures . . . Conceptual interface between man and machines. . . .

May I suggest that it would help to give computing a more human face if people like Michie would stop talking like machines and used a more human language?

Such as English?

S. KEERY

Barnet, Herts.

The Editor welcomes letters on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. All letters are liable to be cut at the discretion of the Editor, unless correspondents state that their letters may not be cut.

KPG sets up firm in States

THE major market potential of its Solitaire small business system in the US has led systems and software house KPG to set up a US subsidiary in Georgia. KPG Inc is at the same time negotiating with several US manufacturers with a view to implementing its software on their systems.

David Turnbull, head of the US operation, said that Solitaire represented at the moment a unique offering in the American market-place, combining a wide range of end-user oriented application packages on a low-cost business microcomputer.

The system was also notable, he added, for supporting both word-processing and commercial data processing on a single set of hardware.

Packages being converted by the company for the US included a retail stores system and billing systems for legal and dental practices. The company could also offer Solitaire accounting packages to US standards, he said.

Developed, according to the company, at a six-figure cost over the last two years, the Solitaire is based on three Intel 8080s (CW, November 24, 1977) and also uses Ontel equipment. A system including a Diablo printer and half-megabyte of floppy disc sells in the UK for under £10,000 and would be sold in the US for around $16,000.

A key feature of the system, of which more than 20 have sold in the UK, is a specially developed stand-alone Basic interpreter and operating system.

Call for papers

A CALL for papers for Specifications of Reliable Software, a conference to be held on April 3-5, 1979 in Cambridge, Massachusetts, has been issued by the organisers, the Technical Committee on Software Engineering of the IEEE Computer Society. Deadline for submission of papers is November 1. Details from Marvin Zelkowitz, Dept of Computer Science, University of Maryland, College Park, MD 20742, tel: (301) 454-4251.

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TIM PALMER REPORTS FROM NEWCASTLE ON THE IBM SEMINAR

Need to retrain systems designers to meet demands of trade unions

OVER the next few years, a major retraining of computer systems designers will be needed to meet the growing demands of trades unions that their members be involved at all stages of design and implementation of new computer systems.

So says Professor K. Nygaard, of the Norwegian Computing Centre, who has been closely involved with the Norwegian Federation of Trades Unions on the formulation of an agreement with national employers' federation on the introducton of computer-based systems.

Professor Nygaard was speaking last week at the Joint International Seminar on the Teaching of Computer Science, sponsored by IBM and held annually at Newcastle University.

He is the creator of the Simula simulation language, and first became involved with the unions in the mid-1960s.

"I found they were using Simula in a completely one-sided way, and rather than reinvent Simula, I decided to work with them," he said.

The Norwegian agreement was signed in 1975, and its key clauses cover the right of employees to be fully informed, in non-specialist language, of plans to introduce computer technology as soon as the first decision has been taken, and before systems design has begun.

An important clause says that employees likely to have their work methods and responsibilities affected by new systems should be involved as much as possible in the project work, so that their knowledge and experience can be used; employees should influence the development, introduction and methods of use of the system.

"As a result of the agreement, 'data' shop stewards have been appointed through whom companies consult the workforce, and the agreement was followed in 1977 by legislation on job protection and the working environment," said Professor Nygaard. The law states that employees and their representatives must be informed of plans to develop computer systems, and should take part in the systems planning process.

Similar legislation is planned in Sweden and Denmark, and Professor Nygaard believes that it is no more than five or six years away in the UK.

"We need far better tools for describing the systems we plan to develop, tools which make it easy to take the parts of the system which are computer based and write the necessary programs. Very non-trivial extensions to our existing tools will have to be made, and I believe that in the future we will have to develop a large number of different profession-oriented languages," he said.

Professor Nygaard saw the growth of distributed processing making the problem much more acute, since computers were now affecting the working conditions of far more people.

"Many people now see the computer version of an event through a display, rather than the real thing. We just do not know what effect this is going to have, and little study is being done. Systems are both flow oriented, and job-oriented, where the individual job is a cross-section of the flow, but the designer typically sees only the flow, and the employee sees only the job.

"Workers must be shown both the flow and the job orientation, and trades unions therefore have a direct interest in good programming languages. People will have to work, communicate and interact in a different way, and systems design will have to be a team effort, with the computer scientist just one member of the team.

Professor Nygaard foresaw problems for designers and a large number of personal tragedies resulting from this.

"The problem lies not in training lay people in computer science: all they need to understand is the impact of a system on the work environment. The real problem is in retraining people already in systems design in order to avoid their getting left on the shelf. Far too many of them adopt as a defence mechanism the dictum 'We know; you are all idiots'."

Professor Nygaard made much of the fact that people have a right to know about things which will affect their working environment, so his audience was amused when he revealed that the Norwegian systems designers were incensed at the Norwegian union-employees agreement, because they were not consulted.

"Ah, but the systems designers were not unionised, you see!" he explained.

Generating a little heat

A SUGGESTION from Mrs Gill Ringland that it did not matter much what language computer science students were first taught, and that Basic was fine, provoked howls of anguish from the delegates at the Newcastle seminar.

Mrs Ringland gave a status report on the Science Research Council's Co-ordinated Research Programme in Distributed Computing, for which she is industrial co-ordinator, and clearly enjoyed stirring up a little heated debate.

Professor Page of Newcastle questioned selection of a specific topic for co-ordinated research, saying that it generated demand and could be a recipe for disaster.

Professor Heath of Heriot-Watt, celebrated for his work on directed graph methods, complained that he had heard very little about the Data Flow project at Manchester, yet it appeared to be a directed graph system under another name.

Professor Neuhold of Stuttgart commented that almost all the SRC projects seemed to use US minis: "In Germany it is very difficult to get a non-German computer for research," he said.

New insights into design of operating systems

A LOCAL area computer network at Cambridge University is providing new insights into the design and working of operating systems.

"Very little work has been done on measuring the internal data rates of computers, but the data rates in a local area ring network are very comparable with those obtaining within a computer running under a general purpose operating system," Dr Roger Needham, of the Cambridge Computer Laboratory, told the Newcastle seminar.

"This means that you can split the functions of an operating system, and make the normally internal data flows external on the ring." The ring at Cambridge consists of two twisted pairs of wires with a 10 Megabit data rate; there are currently five minicomputers attached to the ring, and a repeater every 100 to 200 metres. There is currently one simple device — a graph plotter which happened to be surplus to requirements — attached to the ring, and a line printer is to be added shortly.

The approach to adding low-level devices will be to attach a "station" capable of supporting any device at each repeater. "Ideally, the station should consist of no more than two chips."

He recommended late binding of the addresses of services offered on the network, and that services should be looked up by name rather than association.

DIJKSTRA . . . "a new dimension of complications."

Food for thought on distributed systems

THE theme of the Newcastle seminar was distributed computing systems, and Professor Dr Edsger Dijkstra of Burroughs offered delegates an argument which has proved useful in thinking about it.

"Distributed systems are fun, but they add a new dimension of complication," he said. "The model of the dining philosophers has proved a powerful one for all sorts of exclusion constraints. This argument is the result of at least five iterations, and it is a pleasure to present it because it is now so very beautiful."

Lack of space precludes presenting the argument here, but it concerns a number of philosophers who spend their time either thinking or eating. A table is set out with a designated place for each philosopher and one fork at each place. Unfortunately, however, the meal is a difficult spaghetti which is inedible without the aid of two forks.

"When a philosopher is hungry, he has a number of options open to him: he can wait until one fork is free, grab it and wait for a second; he can wait until two forks are free and grab them both, but that is not very attractive, because if his neighbours conspire, they can starve him."

Professor challenged by one of his peers

A UNIVERSITY professor is never more exposed than when facing a gathering of his peers. Professor Erich Neuhold, describing Porel, a distributed database system being built at Stuttgart University, was immediately challenged by Professor Dijkstra on his statement that data should be stored close to where it is most frequently used.

He conceded Professor Dijkstra's contention that the criteria for location should be most urgent need as well as most frequent use, whereupon Professor Euan Page of Newcastle interjected that the two were mutually incompatible: one was based on forecasts of the future and the other on history.

"That is why designing a distributed system is so difficult," smiled Professor Neuhold.

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COGARVIEW

George Cogar argues that the computer industry profits from recession as much as the arms industry profits from war. . . .

We are displacing people in the jobs that they are happy doing—

THE computer industry seems to be in an unusual measure of agreement that 1977 was a great year, 1978 will turn out to have been even better and that 1979 is *shaping up as the hottest 12* months in the industry's history.

The mainframers don't seem to have been impacted by IBM's flurry of price cuts and new models; the minicomputer makers seem to be surviving the threat from Series 1 on the one hand and microprocessors on the other without difficulty; the plug-compatible firms are viewing the 303X line with, at least public, unconcern.

Yet we are told by the economists that we are failing to emerge from a dire recession, and by the unions that companies' failure to invest in fuelling a potentially dangerous level of unemployment that *could lead to the collapse of* Western civilisation as we know it.

All of which confirms the impression as many of us have had that the computer industry profits from recession as much as the arms industry profits from war.

The fact, unpalatable for some, is that computers are the one clear, anti-inflationary investment any company can make.

Take West Germany, for example, where it has recently been calculated that the average cost of employing someone in 1980 will be just under $20,000, a figure which includes, of course, *all those Turkish road sweepers* and Yugoslav chambermaids. Obviously if you can buy a machine for $20,000 which will mean employing two people instead of three, you buy the machine and turn a healthy profit from the deal in 1981.

Of course, computers are creating unemployment. I cannot understand why there should be such controversy on this point. Is it because we are so conditioned by trade union propaganda that to admit such a thing is like owning up to extra-marital sex? Not many people are actually fired because a computer is going to take over their jobs, but many jobs dis*appear through what is* euphemistically termed "natural wastage." And the result is the same, even if it's sugar-coated. There are more machines and fewer jobs.

Trade unions are, in part, to blame for this. Their wage demands, imposed with lamentably short-sighted determination, helped to fuel the inflation against which employers are not reacting. And their resistance to labour flexibility helped to make capital intensiveness preferable to labour intensiveness — a reversal of the historic relationship between the two.

Once upon a time labour forces were handled very flexibly by companies. If my workload as an employer increased, I hired extra people to cope with it. If it decreased, I fired enough people to restore equilibrium. On the other hand, if I bought a machine I had to continue bearing the cost of that machine whether it was in use or not. Obviously it was preferable to hire and fire people.

Today, almost everywhere in the developed world, the reverse is true. In some Western countries like Italy or Belgium, it is virtually impossible to lay people off at all. In others, it is very expensive and the legislation in relation to redundancy changes all the time.

Certain classes of jobs are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. The list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with. No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a *basis on which I can plan.* The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically short-sighted, is not the computer industry equally so?

It is, for instance, a feature of the present chronically high levels of unemployment in the West that they are selective rather than across-the-board. While there are long queues of skilled workers at the dole counter, there are also long lists of unfilled vacancies at the Job Centres.

What's happening is that certain classes of job are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. It's a fair prediction that the list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

In Sweden, for example, it is reckoned that 75 per cent of workers will have post-High School qualifications of some sort by the end of the century. Who wants a diploma to empty dustbins?

But has the computer industry had the social and economic far-sightedness to predict the impasse and cater for it? No. The vast majority of computers we make and systems we implement are designed to displace people in the very kinds of jobs that people are happy doing — clerical and administrative work. You don't find many computers hewing coal, emptying dustbins, cleaning sewers or making beds.

Just as the trade unions adopt ad hoc policies to deal with problems as they become acute, so computer manufacturers have consistently taken the easy path, producing the systems that could be configured with the least effort, equipped with the software that was easiest to write.

I have argued before in this column and elsewhere that a methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpoint to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I would be willing to bet that the proportion of all R&D money going on robotics is infinitesimal. Yet at least some of the jobs which are going to become socially unacceptable involve relatively predictable sequences of activities which are probably within the grasp of existing technology, if properly applied. Others, of course, are not. It will presumably be many years before we see the first robot emptying dustbins.

For that matter, how much money is being devoted towards the leisure contribution computers might make to alleviating the unemployment they cause. There are, to be sure, a few experiments in the field of CAL, electronic music, and widebeam communications which might have an eventual relevance, but their social dimension is pure coincidental. Yet it is becoming a cliche, at least among computer people, that we all will have to develop an enormous capacity for leisure in the future.

Just as the trade unions accept ad hoc policies to deal with problems as they become acute, so computer manufacturers have consistently taken the easy path, producing the systems that could be configured with the least effort.

So what are we, who are supposed to glimpse most clearly what the need will be, going to do about it?

The argument at this stage, of course, is not about what applications might or might not be feasible. It is about whether governments, manufacturers and trade unions are prepared to sit down and consider a plan of action for the future which could stand the industry's possibilities on their heads. I am not to be frank, optimistic.

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ATLANTIC

32-bit switching mini from Tymnet

A NEW 32-bit network — switching minicomputer designed from the ground up for implementation of a wide variety of communications protocols including the international X25 packet-switching standard has been introduced by the Tymnet subsidiary of Tymshare.

Tymshare is implementing a second generation of its large US Tymnet time sharing network and will progressively introduce the new processors, called Tymnet Engines, into its 320 mode network. Most of the *modes in the network still use* Varian 620 minicomputers, but about 25 use Interdata 7/32 and 8/32 machines.

Tymshare has offered the new processor to the UK Post Office as an alternative to the French Transpac and US telenet microprocessor-based X25 switches for the forthcoming UK Packet Switched Service which will succeed EPSS. So far, the Post Office has shown little interest, despite an offer from Tymshare to build the Engines in the UK if local manufacture is an issue.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis, Internally-switched interface system.

A typical node configuration, capable of handling 32 synchronous lines running at up to 9600 bps, and 128 asynchronous lines running at up to 1,200 bps, with 64K words of main memory. All the protocols so far implemented, would cost about $80,000. The network control node would cost about $120,000.

Protocols so far developed include two versions of X25 — the one used by Telenet and the Canadian Datapac version, Snap. X75, the protocol for interfacing one packet network to another has been developed, and will be used for the link between the French Transpac network and Tymnet.

There is also IBM 2780 airline communication protocols and Tymnet's one internal protocol. The machine has been designed to accommodate up to 64 different protocols.

Digital Equipment's DDCMP and Burroughs' BDLC are among a large number of others planned.

Tymnet II, the enhanced version of Tymnet being established around the new processor, is being implemented to ward off possible competition from AT&T's proposed US-wide Advanced Communications Service, and the ability to handle so many incompatible protocols could prove crucial.

It will allow machines using one protocol to communicate with machines using any of the other ones accommodated on the Tymnet Engine.

Tymshare also plans to market the processors and software to other companies and organisations, both in the US and internationally to build their town networks.

Although the UK Post Office is planning to base its International Packet Switched Service on Telenet equipment, it is currently running the database access service on Tymnet equipment.

Adopting a computer-based system has spelt more profits for Frank Powell, estate agents of Wigan. Based on the UK produced BCL Molecular 18, the system has already increased the number of houses sold per week and allowed sales staff to give more time to interviewing clients. The picture shows one of the staff feeding information into the system.

Carving a chunk of the estate agent's market

SYSTEMS based on an Intel 8080 and built by Real-Time Computer Systems of Crewe, and another based on a BCL Molecular 18 are helping to carve out a growing market among estate agents for the use of computers in the personal home buyer market.

And estate agents Whitegate in Yorkshire, Henning in Devon and Cornwall, and Frank Powell in the Wigan area also challenge the claim by West London estate agents Chadwick Bird and A. A. Dickson that they were the first to implement computer-based systems for personal home buyers (CW, August 24).

A spokesman for Whitegate, which is part of the Provident Financial group, said that its offices have been using custom-built micro-based systems since January to handle the matching of property with a likely buyer, and the printing of address labels for mailing lists.

Built by Real-Time Computer Systems, each unit consists of an Intel 8080 microprocessor with four floppy disc drives and a Soroc VDU.

Property information is input via the VDUs by using a screen format that matches the agents paper document layout. Once this is done, the whole day's input is then transmitted over Post Office lines to Provident Management Services' computer centre in Halifax where it is processed by the group's Univac 1106 to find buyer/property matches. It is then retransmitted to the source office.

Ten systems have been installed by Whitegate and another four are on order. Also, two systems have been ordered by Hennings estate agents which has offices in Devon and Cornwall.

A system based on UK hardware, the BCL Molecular 18, is *being developed for estate* agents Frank Powell.

The Real-Time Computer Systems units will be marketed by PMSL, part of the Provident Financial Group, while Davison Technical Services is currently negotiating with BCL on the possibility of marketing its Molecular 18 system as part of an estate agent package. Chadwick Bird and A. A. Dickson both use Wang 2200 systems.

Growing market demand for Pet software

WITH about 500 Pet computers a month now being sold by Commodore, the market for software to go with it is building up rapidly, according to Julian Allason, director of the Pet software house, Petsoft.

The company has recently introduced another catalogue, with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allason feels that the time is right for larger software houses, which are more used to the mini and mainframe computer market, to think seriously about the potential of microcomputers.

With an existing distribution and sales structure in this area, he feels that Petsoft could form joint ventures with some of these companies, marketing the results of its expertise.

NEWS IN BRIEF

Harris in BL spares update

AS part of a program to make its Chorley, Lancs, vehicle spares complex the most modern in Europe, Leyland Vehicles has installed a £150,000 Harris distributed system based on 24 Harris 8170 video terminals and an eight-display 8180 system.

Twenty-six 8170 terminals are already installed at Chorley, handling online inquiries relating to 250,000 current and superceded vehicle parts. They also handle goods inwards control.

The remaining six 8170s were used for program development at Leyland Vehicles' offices in Preston while the 8180 distributed processing system is being used to back up online data preparation and order processing procedures at Chorley.

Aids for developing NS packs

FASTER development of applications software for the National Semiconductor SC/MP processor is now possible, following the introduction by the company of a cross-assembler package for use on Intel MDS-800 and similar micro development systems.

It consists of a set of macros loaded into the macro tables of the host development system, and in applications software development, uses the conventions associated with the development system. Output code is in the format of the host system, so allowing direct programming of memories, using available facilities.

Most directives, expressions and memory reference instructions are in the host computer dialect and for the commonly used operators, high and low address orders, two special macros have been developed.

Plotters launch

A RANGE of intelligent drum and flat bed plotters designed around a 16-bit microprocessor has been introduced by Computer Instrumentation Ltd. Called the CIL Series 4, the plotters are intended to relieve the load on the host mainframe. There are three drum plotters in the series, the 4/40, 4/50 and 4/60, and one flat bed unit, the 4/74.

Minimac launch

MULTIPLE access software announced by ICL in June for educational users of the 2903 has now been launched by the company for industrial and commercial users also. The system, Minimac (CW, June 1), supports batch working and concurrent online access from up to 32 terminals.

First B7800

FIRST deliveries of Burroughs' large-scale B7800 mainframe, originally scheduled for March, will now be made next month, to Isuzo Motors in Tokyo. The delay was caused by unexpectedly heavy demand for the older B7700 mainframe (CW, March 30).

Staff priority

THE Computing Services Association has established a working party under Data Logic *managing director* Alan Thomas to tackle staff training, which the CSA regards as a "top priority". The working party has already initiated a study among CSA members on training needs (CW, August 31). At the beginning of next month the CSA and BCS will host a day in London for career advisers in further education and series of talks to sixth formers have already been started by the working party.

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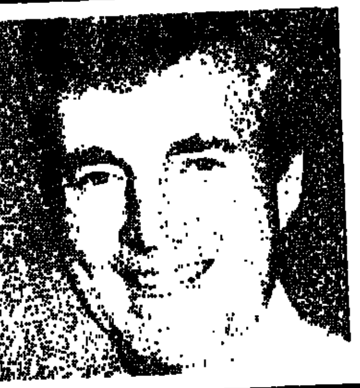
Users begin to make their voice heard on telecomms policy



By Morris Edwards

The potential of the telecommunications industry has long been understood by the companies that build the equipment and provide the services. It is from those sectors that the strongest representations have come when policies to guide and govern the industry have been under discussion. Now, the users are beginning to make their voices heard and in the US their lobby is becoming a force to be reckoned with. Morris Edwards looks at the current scene and at the organisations that are putting the case for the user.

AS Congress and the Federal Communications Commission weigh decisions that could shape computer communications operations in the US for decades to come, a new voice is belatedly joining the chorus of special interests that always attends such deliberations in the nation's capital.

The voice is that of the user who had traditionally been a silent witness to decisions greatly affecting his or her destinies.

Until recently, computer and communications users were seemingly complacent about legislative and regulatory affairs. Travelling to Washington to present their views would mean time, money and effort that would have to be diverted from the primary task of getting and keeping their systems up and running. Accordingly, by default, users handed over the forging of industry directions to AT&T and other vendors, with the resources to lobby on behalf of their interests.

All that changed, however, with the introduction of the Consumer Communications Reform Act of 1976 — better known as the infamous Bell Bill — which would effectively have given AT&T a total communications monopoly.

Besides exercising both computer and communications vendors, the Bill struck home with using organisations which began to realise what non-representation in Washington could mean to the cost and manner of doing business.

Since then, Congress has dropped the Bell Bill, but substituted more encompassing legislation aimed at re-writing the Communications Act of 1934, to bring it in line with modern technology. Similarly, the FCC has been conducting a second major inquiry into the relationships between computers and communications and how user interests might best be served by the merging of these technologies.

As if this were not enough to keep communications policymakers busy, AT&T recently filed an application with the FCC to provide its Advanced Communications Service, which promises to revolutionise the makeup of the computer/communications industry and mould user operations for the next decade or more.

Clearly, the time is ripe for user involvement in communications policy issues, and fortunately, the general business climate is favourable too. With today's highly competitive marketplace, corporations and other organisations that are heavy users of data communications have begun to look for ways to curb costs for these services.

Diligent communications managers have been able to take advantage of this mood to make corporate management aware of the bottom-line impact of current, as well as proposed, regulation and legislation. At the same time, using organisations appear more willing to address openly the issues without worrying about the backlash that could come from antagonising AT&T, IBM and other major vendors with political clout.

Likewise, as communications management personnel have become more visible both inside and outside of their organisations, they seem more confident in making their identity and views known.

Meanwhile, policymakers in Washington, recognising that they were principally hearing the slanted perspectives of competing vendors, were reaching out for the more objective insights of the users who would ultimately be the beneficiaries, or the victims, of their deliberations or conclusions.

Contrary to what they had been told was a supposed lack of interest in their views by the Washington establishment, users found it was not that hard to get an attentive audience.

Users, in fact, were a welcome, helpful and most credible addition to the Washington scene, where regulators and legislators recognised that users brought with them an objectivity and everyday real world knowledge of communications operations that could not be matched by vendors and other industry observers.

Even so, it was still a challenge for users to get involved with public policy matters within the constraints of frequently limiting corporate and organisational policies and the professional demands on their time.

A major breakthrough occurred when the West Coast based Tele-Communications Association, the nation's largest regional user association, passed a pro-competitive, anti-CCRA resolution on behalf of its membership. It comprises about 275 companies, including a broad range of industries, educational institutions and government agencies.

With the approval of at least two-thirds of its members, the TCA's landmark resolution supported a policy of continued competition in the private line and telephone equipment market, thereby opposing enactment of the CCRA in any form. With this action, the TCA became the first communications user group to take a position on a national policy issue, and the association used the resolution as a springboard to present its user perspective at various Washington agencies and in Congressional hearings.

In the face of possible member dissension, and threats of withdrawal by some of its frightened constituent firms, the TCA boldly moved ahead and has emerged as a strong and informed industry voice. Its member rebellion never materialised; its contributions to regulatory and legislative bodies have been significant and, most importantly, it set a needed example for other user associations to follow.

When the International Communications Association convened its national meeting in Las Vegas last May, there was already a groundswell of sentiment in favour of that prestigious and highly respected association taking part in policy debates.

Formed in 1948, the ICA has close to 400 organisation members with slightly over 1,000 individuals from industry, commerce, government and education. Some of its members with experience in national policy-making and with the conviction that meaningful user influence was not only possible, but necessary, spearheaded what turned out to be a clear cut ICA commitment to take a more direct and active role in the communications regulatory and legislative arenas.

Fuelled by these precedents and already quite concerned about the potential impact of Washington events on data communications, another young user group, the Association of Data Communications Users was poised for its entry into the public policy area, when a proposal for this activity came before its members at their annual gathering in Pennsylvania in June.

ADCU was only formed in November, 1975, but already has about 170 members, most of whom are member firms. At its annual meeting in June, ADCU established a Public Policy Committee to make reports and recommendations for courses of action that the association might follow on specific public issues related to data communications.

The committee is also chartered to keep members informed of new developments, proposed services, tariff filings and related matters of general concern emanating from federal, state and local regulatory, legislative and judicial agencies, departments and committees.

In addition, with the growth in public data networks in Canada, Europe and Japan; ADCU would like to work with similar user groups abroad to protect user interests related to international data transmission, the interconnection of public data networks and like activities.

Interested parties should contact the association president, John P. Compitello, of International Paper Co, c/o ADCU, PO Box 1184, New York, NY, 100[illegible]

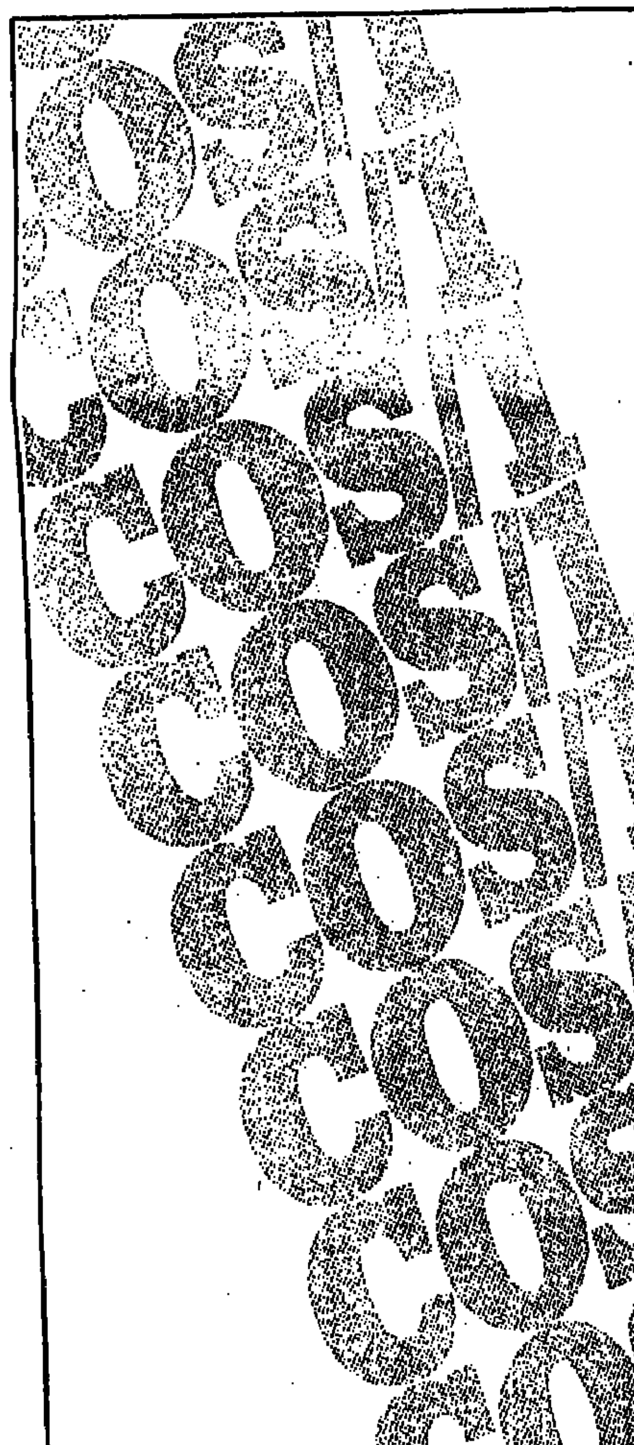
The time is ripe for user involvement in communications policy issues, and fortunately the general business climate is favourable too.

While the user movement is only now gaining momentum, it has already scored some successes to go along with its CCRA laurels. In the FCC Computer Inquiry II proceedings, for example, an ad hoc communications user committee gave one of the clearest and most useful insights into the issues on record, and it is believed that user viewpoint strongly influenced the ultimate findings.

Users also participated directly in hastily constructed eleventh-hour efforts to keep the US Postal Service from becoming a major, and possibly dominant, factor in the electronic mail business.

Although the USPS entry into the data communications [illegible] was aborted principally through the efforts of House Communications Sub-committee chairman, Lionel Van Deerlin, and the CCIA, user attitudes [illegible] influence were important [illegible] juncts to the pre-emptive effort.

As the user movement continues to expand, the stage is being set for a pooling of association efforts, to exert even stronger user influence. It is possible that the momentum may also carry over into the international arena, and that individual user firms, as they become aware of how effective they can be in deriving bottom line benefits from taking a stance on communications policy issues, [illegible]



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Tuesday, October 17, 1978, at the Holiday Inn, London

Because DP is a service function, it depends on its users for ultimate success. But users from the Board to the shop floor differ in needs and outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP

This practical workshop, to be run by Nigel Laurie of Communications Audit, will help delegates to discover the techniques and approaches that work best in helping to manage successful user relations. The workshop is practical and based on experience. Above all it is participative so that delegates can put theory into practice. A summary of a survey conducted at a previous Nigel Laurie workshop on this subject was published in Computer Weekly on May 25.

For this latest workshop the number of participants will be limited in order that the maximum benefit may be achieved. If you would like to reserve a place please complete the application form and return it to the address shown, not to Computer Weekly or the IDPM. A brochure giving further information about the workshop may be had from Tony Swain, BIT, 40 Bowling Green Lane, London EC1 0NE. Tel. 01-837 3636.

To: Conference Administrator, IPC Business and Industrial Training, Surrey House, Throwley Way, Sutton, Surrey SM1 4QQ. Telephone: 01-643 8040.

Please reserve... ...places for the Successful User Relations Workshop to be held at the Holiday Inn, George Street, London on Tuesday, October 17, 1978. The fee is £50 (plus VAT £4), for members of the IDPM it is £45 (plus VAT £3.60). This covers attendance at the workshop, coffee, lunch and tea and full course documentation.

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ARE YOU A MEMBER OF THE IDPM?

MICRO NEWS

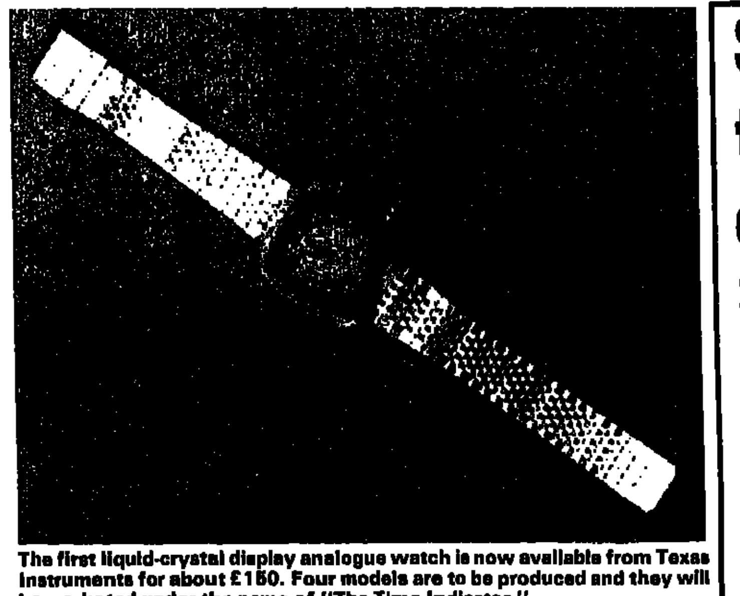
Edited by Martin Banks

TI offers the 'time indicator'

OVERCOMING the difficulties previously encountered with standard I²L circuits in driving liquid-crystal displays, Texas Instruments took the idea of digital watches back to the drawing board and has come up with the first electronic quartz analogue watch.

Called "The Time Indicator," the watch has a low-voltage ester based material for the display, which enables an LCD representation of the hour and minute hands to be given, so replacing the digital numerals of standard LCD/LED watches.

Power for the watch comes from a lithium manganese dioxide cell.



The first liquid-crystal display analogue watch is now available from Texas Instruments for about £150. Four models are to be produced and they will be marketed under the name of "The Time Indicator."

Sales jobs pay better than marketing in US components industry

CHIEF sales executives in the US electronic components industry earn more than chief marketing executives, according to a study by the Venture Development Corporation, the electronics industry consultancy, of Wellesley, Massachusetts.

The study, Marketing Policy: Electronic Components, shows that the salaries of chief marketing executives in all sizes of components companies are usually in the $25,000-$30,000 per year range while their counterparts in sales often receive over $30,000 in medium-size companies, with the figure rising to $40,000 in large concerns.

The study also shows that autonomy is often the prime motivating factor for chief marketing and sales executives and not money, as one might have supposed. But despite its importance, components companies often ignore autonomy as a means of attracting personnel, preferring instead to concentrate on "accoutrements of office."

Another finding of the VDC study is that small electronics components companies with annual sales of less than $10 million frequently carry out more market research than medium-size firms with sales of $10-$25 million per year. Although very small companies do practically no formal market research, activity increases in companies selling more than $1 million only to decrease in companies showing sales worth over $10 million.

The VDC study aims to combine research into the marketing practices of electronics components manufacturers with specific recommendations for companies to implement. In addition to salary and market research, areas covered include organisational structure, comparison of differing distribution methods and handling of marketing budgets.

Quick response to DoI's £15 million MAP scheme

THERE has been a quick response to the Department of Industry's £15 million Microprocessor Application Project scheme (CW, July 13) and the first funds have already been allocated to support work on the development of a new application.

MAP covers three areas — training and courses, handled by the National Computing Centre in conjunction with the DoI; feasibility studies carried out by authorised consultants and controlled by Warren Spring Laboratory; and the funding of applications which is dealt with by DoI headquarters in London.

In this last part of the scheme there have been over 1,700 inquiries from companies seeking further information and over 40 projects have been put forward for funding. The applications cover a very wide range of industries and products including weighing machines, transportation, machine tools, business machines, instruments, agricultural equipment, vending machines, chemicals, heavy industrial equipment, textiles, household goods and games.

Under the consultancy section of the scheme nearly 50 companies have so far responded to the invitation to be registered as authorised consultants and the department is waiting for replies about 70 others. The main condition for being included in the MAP-Consultants list is that the applicant must have successfully completed a project using micros.

One of the first to join Mapcon was Mektronic of Manchester, and managing director Brian Benster commented on the speed with which the DoI had got the scheme off the ground.

Companies wishing to develop micro-based systems will be directed to authorised consultants such as Mektronic who will carry out a feasibility study. Under Mapcon up to £2,000 of the cost of the study can be recovered.

At present Mektronic is offering a "managers' teach-in," at £99 a time plus travelling costs, which is designed to tell managers what microprocessors are, what they can do, how they are used and what they cost.

Zilog dialogue

A ONE-DAY seminar will be held in London and Manchester, next month, by Zilog and its distributors Cramer Microsystems, aimed at software houses and business systems specialists.

Five speakers from the two companies will review new products and applications, particularly in Zilog's MCZ range of microcomputers, as well as already available software, including Cobol, Extended Basic, Fortran and PLZ.

The Zilog dialogue, as it is called, will take place in London on October 10 at the British Academy of Film and Television Arts and in Manchester on October 12 at the Playboy Club.

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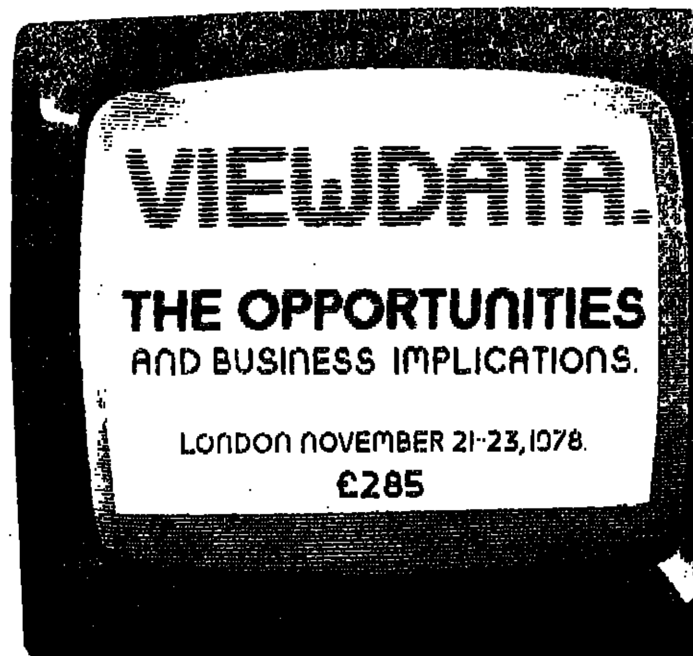

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The hardware in use is the ICL 1900 range running under GEORGE II but plans are well advanced for an upgrade to the 2900 series so any experience gained on 2900 models would be advantageous.
A competitive salary is coupled with an attractive benefits package which includes LV's, 4 weeks vacation and a subsidised mortgage.

Reference JC37/1

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Reference JC37/2

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Reference PG37/3

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Candidates should have a working knowledge of German. SALARY RANGE 45-70.000 D.M.

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They are currently installing a small but powerful Harris virtual memory computer system at their Bayswater offices.

On behalf of our client we are seeking a mature and adaptable ANALYST who wishes to remain involved in the technicalities of programming.

Your experience should include implementation fo at least one complete system, and a good usage if IBM Assembler. Demonstrated supervisory ability is essential.

Useful additional experience would include Fortran, systems or software programming, and training or sales background, whilst knowledge of market research, interactive processing, minis, or ICL equipment would be an added bonus.

The appointment is at executive level, and will include supervision of several technical staff, as well as analysis and programming.

Benefits include pension scheme, life assurance scheme, profit sharing and LVs.

Applications should be addressed to DEREK PEARSON at the address below in the first instance.

Contact Derek Pearson

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

What would make you take on a computer job in Aberdeen?

The place?

Aberdeen, the Granite City, is almost certainly one of the most beautiful cities in Europe. It is surrounded by the scenic attractions of the Scottish Highlands and has for many years been one of the United Kingdom's main fishing ports. But now with the advent of North Sea Oil, it is an even more prosperous and thriving community. Aberdeen is a port, a University town, an excellent shopping centre, a forward looking city with a great future.

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All year round Aberdeen is a hive of activity, that goes for anything from mountain climbing to music making. It is only to be expected from the city that gave Scotland her first painter, her first performed play, her first poet, and all of Britain its first University course in Medicine! A city of sport, of the arts, of learning – a city with a rich past and an equally rich present.

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Our climate is generally good, with hot summers that have made Aberdeen a popular holiday resort and sharp winters, which are an advantage for the winter sportsman or woman. We are within easy reach of Aviemore and Glenshee, with the Grampian mountains on the doorstep.

The employer?

The North of Scotland Hydro-Electric Board is responsible for supplying electricity to over 25% of the landmass of Great Britain. We know our business and do our job well. Our accounting and engineering departments make extensive use of our computers and are now expanding their computer based activities.

The money?

The panel opposite gives an idea of the salary scales we are offering, but the actual salary will depend entirely on you. Your experience and ability are what we need and we are willing to pay for it. If you are looking for a real career with opportunities for advancement in a growing organisation look no further. Assistance will be given with moving expenses where necessary.

The challenge?

We are now expanding our computer centre in Aberdeen and will be installing a large new configuration with a comprehensive terminal network to replace our existing ICL System 4 computers.
Engineering programs extend through generation, transmission and distribution. Commercial activity – apart from billing, payroll and accounting – will be extensively developed into management accounting and enquiry processing. A challenge indeed, but if you think you can meet it read on.

Commercial

SENIOR SYSTEMS DESIGNER
£5495-£7145
Minimum of 4 years' experience, ability to control projects.

SYSTEMS ANALYSIS
£3985-£6130
Minimum experience 2 years. Knowledge of business practice or O&M an advantage.

Programming

SENIOR PROGRAMMER
£4660-£6130
Minimum of 3 years' Cobol experience. Ability to lead projects.

PROGRAMMER
£3985-£5470
Minimum of 18 months' Cobol experience.

Engineering

SENIOR SYSTEMS DESIGNER
£5495-£7145
Minimum of 4 years' experience, ability to control projects.

SYSTEMS ANALYSIS
£3985-£6130
Minimum experience 2 years. Engineering background or qualification an advantage.

Salary and conditions of employment are in accordance with the NJC Agreement for the Electricity Supply industry with placing on PAG Grade plus productivity payment currently giving the total earning potentials as shown above.

If you are interested and want to know more about any of the above posts, contact our Computer Services Manager now.

North of Scotland Hydro-Electric Board, Computing and Accounting Centre,
Ashgrove Road West, Aberdeen AB9 2NY. Telephone (0224) 69267.

We've made things easy for you!

If you're chasing a new job or a new contract, save time by filling in your application form here and now.

Personal Please write in ballpoint, using block capitals.

Surname _____ Forenames _____

Address _____

_____

Tel. Home _____ Office (discretion will be used) _____

Age _____ Place of Birth _____ Car? _____

Are you prepared to relocate? _____ UK/Abroad (delete)

Experience Place no. of yrs. in box, e.g. IBM 360/370 4

Machines: Please specify model.

IBM 360/370		Commercial	
IBM others (specify)		Financial	
ICL 1900/2900		Payroll	
ICL others (specify)		Production control	
Honeywell		Stock control	
Univac		Scientific	
Burroughs		Realtime	
PDP		Software	
Other mainframes (specify)		Database	
		Message switching	
		Communications	
Other mini-computers		Data transmission	
(specify)		Central process	
		Teleprocessing	
		MIS*/CPA*/PERT*	
		Magnetic tape	
		Disk	
		Others (specify)	

Languages

Cobol	
Plan	
Assembler	
PL/1	
Fortran	
Filetab	
RPG11	
Auto*/easy*/user code*	
Others (specify)	

Operating Systems

DOS		Operations supervisor	
OS		Operator	
George (specify)		Consultant	
CICS*/HASP*/GRASP*		Sales representative	
DBOMP*/MVT*/IMS*/CMS*		Others (specify)	
Others (specify)			

Job Titles

Project leader	
Systems analyst	
Systems engineer	
Analyst/programmer	
Systems programmer	
Programmer	

* Delete where inapplicable

Position sought Please state briefly the type of appointment you are seeking.

_____

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Minimum salary £ _____ Notice required/Date available _____

Signed _____ Date _____

Cut out the whole advertisement and post to the address below.

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HONEYWELL GCOS OPERATORS
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COMPUTER PERSONNEL CONSULTANTS LICENCE NO. SE(A)62

C/W 14.9.78

THE RUGBY PORTLAND CEMENT COMPANY LIMITED

invites applications for the position of

R.P.G. PROGRAMMER

The successful applicant will assist in the further development of the Company's expanding Univac 9480 installation situated at Head Office.

Applicants must have at least one year's R.P.G. experience and must be able to work with only limited supervision.

Promotion prospects are good.

Salary:	Negotiable
Location:	Head Office, Rugby
Other Benefits:	Four weeks' holiday a year; profit participation; non-contributory pension scheme.

Applications giving full particulars should be addressed to:

The Secretary
The Rugby Portland Cement Company Limited
Crown House
Rugby, Warwickshire CV21 2DT

UNIVERSITY OF SURREY

COMPUTING UNIT

ANALYST/PROGRAMMER

Salary scale to £6655 per annum

The Data Processing Section of the University's Computing Unit has a vacancy for an analyst/programmer to be responsible for all computer systems required by the Library and Bookshop. Duties include system analysis, specification, design, programming, testing, documentation and implementation. First priorities will be the development of a completely new system to control the ordering of books, and the provision of online functions for book borrowing and reservation.

Some successful system design work, and at least two years' programming experience (Cobol or similar) are essential requirements; but experience in particular applications, or with particular computers, is less important than the personal qualities of adaptability, self-motivation and an ability to communicate.

For further details, or to arrange an informal interview, please telephone Mr. A. Hill on Guildford 71281, Ext. 730.

Applications, in writing, including the names and addresses of two referees, should be addressed to the Staff Officer, University of Surrey, Guildford, Surrey GU2 5XH.

THE UNIVERSITY OF MANCHESTER REGIONAL COMPUTER CENTRE
Director: Professor Gordon Black

Applications are invited for the following post

MACHINE ROOM CONTROLLER

The Regional Centre has two powerful central computing complexes each consisting of a CDC 7600 Computer (one of the worlds most powerful) front ended by an ICL 1900 series computer (1906A and 1904S respectively). Access to these systems is provided at the Centre and through a comprehensive communications network enabling work to be submitted from remote job entry terminals on the Manchester campuses and at over 30 other universities throughout the country.

The Machine Room Controller is directly responsible to the Computer Manager for the efficient day to day running of the central computing equipment and for the control and discipline of central operating staff. He/she will be expected actively to participate in the running of the centre and in forward planning projects. Applicants should have a good working knowledge of the ICL George 3 operating system and a knowledge of Scope 2 would be an advantage; they must also have previous supervisory experience, preferably on a large installation and be able to demonstrate a high level of self motivation.

Salary £3,384-£6,804 p.a. (under review). U.S.S.

Further details and application forms (returnable by September 25th) are obtainable from the Registrar, The University, Manchester M13 9PL, quoting ref: 216/78/CW.

THE POLYTECHNIC, HUDERSFIELD
Department of Computer Studies and Mathematics

PRINCIPAL LECTURER, SENIOR LECTURER OR LECTURER II — COMPUTING. Ref: ACA/2298

Applications are invited for the above post which is to support and develop the work of the Department in computing. The principal degree and diploma courses within the Department involve higher studies in applications of computers in business and industry. Applicants should have appropriate experience of at least one of the following areas:

(a) information analysis and systems design
(b) applications programming
(c) design and implementation of data bases

A good Honours Degree and/or MBCS is essential.

Staff are expected to undertake activities, including research, in addition to teaching duties.

Salary: PL £7047-7818(Bar)-£8844
SL £6051-7068 (Bar)-£7577
LII £4101-6668

Further details and application forms, which should be returned by 28 September, 1978, from the Establishment Officer, The Polytechnic, Queensgate, Huddersfield HD1 3DH (Telephone 22288 Ext. 2220).

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RUISLIP	ANAL/PROG 2 yrs.	To £6,000
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MORDEN	PROGRAMMERS cobol	CE5,500
SURREY/MIDDX/LDN	PROGS RPG 11	CE5,500
CRAWLEY	PROG 3 yrs. ASSEM	£6,500
REDHILL	SOFTWARE PROG 3 yrs.	£5,500
FARNBOROUGH	PROGS PL/1 Irale others	£5,500
CRAWLEY	ANAL/PROG PL/1/RPG11	NEG
SLOUGH	SYST PROG IBM	CE5,000
REIGATE	PROGRAMMERS cobol	CE6,000
SOUTHALL	PROGS cobol on line	CE5,000
HORLEY	PROGS 1 yr. prat. mini	NEG
RUISLIP	PROGS any language	To £5,000
NORTHANTS	PROGS ICL cobol 1 yr.	CE5,000

Please telephone or call in for details of these and other vacancies and an Application Form.

AMES PERSONNEL

Employment Agency Suite 14, Dryden Chambers, 119 Oxford Street, London W1R 1PA Tel: 01-434 1106

MATHEMATICIAN/ PROGRAMMER

London up to £5202

The Mathematics and Computing Division of the London Research Station provides a consultancy service to the other divisions and regions of British Gas. We have a large UNIVAC 1106 Computer which is used for program development and as a bureau to the Industry.

The Mathematics Group provides mathematical models and programs for the solution of a wide variety of engineering, mathematical and management problems.

A Scientist is required in the Mathematics Group who should have a good degree in a numerate discipline preferably with 3-4 years' relevant experience. This must include programming, preferably in Fortran. Experience of direct user contact in the formulation of problems is desirable.

Starting salary will depend on qualifications and experience on scales ranging from £3531-£5202 including Inner London Weighting.

The London Research Station offers good career prospects in a friendly, relaxed atmosphere within a modern building on the borders of Chelsea and Fulham.

For further information please write with full details of age, experience, qualifications and current salary, quoting reference LRS/804607/313/CW, to the Research Secretary, British Gas, London Research Station, Michael Road, Fulham, London SW6 2AD. Closing date for applications 28 September 1978.

BRITISH GAS

Computer Auditing

Salary £6,300 to £6,750 (based at Reading)

As the Internal Auditor (Computer) you will join the Computer Auditor in carrying out the full range of computer audit activities, especially in the review of new and existing computer systems and in the examination of the operation and security of the Authority's computer installations.

The use of computing at Thames Water is expanding, and currently the Authority operates two IBM 370/148s supporting a large teleprocessing network, and an ICL 1903T providing a service including on-line programming. There are also various agency and commercial bureaux arrangements.

Candidates (male/female) should be able to demonstrate a significant experience of financial computer systems and have the ability to criticise constructively and communicate effectively.

Good conditions of service. Casual user car allowance (Subject to review).

Applications, giving names of two referees, should be submitted to the Director of Finance, Thames Water Authority, Nugent House, Vastern Road, Reading, Berks RG1 8DB, by 29th September, 1978.

Thames Water

Computer Manager

£9171-£9783

To create, motivate & co-ordinate

The London Borough of Harrow, with its expanding computer services department, currently requires a Computer Manager to control, co-ordinate and further develop its computing work.

High level managerial skills will, of course, be essential in heading a team of 42 staff and in training new recruits. Technical competence in both hard and soft ware will be needed, as will financial ability to ensure departmental budgets and resources are used cost-effectively.

To be considered, you'll need inventiveness, too. It is envisaged that ultimately most operations within the organisation will be computerised, so apart from maintaining existing high standards of service, you'll be expected to implement developments and strategies, plan new projects and campaign for their acceptance. It is therefore a unique opportunity with plenty of potential for a man or woman who is ambitious, enthusiastic and eager to lead a computer team from one success to another.

Your advice will be sought on all aspects of computing, and it will be your responsibility to ensure mutual understanding between computing staff and users of the service.

IBM experience is preferred, and a proven track record of managerial success will be looked for.

Further details are available from Ron Thom on 01-863 5611 ext. 2202.

Write, with full personal and career details, to Malcolm Hughes, Assistant Controller (Manpower Services), London Borough of Harrow, P.O. Box 57, Civic Centre, Harrow, Middlesex HA1 2XF.

Harrow

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to £8000

South Yorkshire

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The position involves:-

* total responsibility for all aspects of operations
* a progressive dp minded senior management
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* an expanding dp function

The rewards for an experienced operations professional are:-

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If you are a professional and want to be treated like one contact:

PETER TUGGEY at
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MINI PROG — LONDON
to £6,000

A bright future here, within computer services division of major financial and banking group for persons wishing to work on PDP II mini computers. Company requires 2 persons at varying levels (i.e. 1-3 years), PDPII, BASIC + and RSTS experience but will consider good mainframe and high level language to be trained.

- Brand new projects of financial and commercial nature.
- Opportunity to go onto MINIS.
- Good future and bright career.
- Benefits include sub mortgage after statutory period, profit share, flexi time, etc.

REF. 1769

PROGRAMMER—CITY
£5,000c

Famous world-wide banking organisation, retaining amongst its various computers, IBM 370 hardware with T.P. monitor, has a rare opportunity for a programmer with good COBOL experience. Initially he/she will be involved in all aspects of programming but with a view to go *into analysis and eventually be trained as a* systems analyst.

- Long-term career prospects.
- Excellent training facilities.
- Fringe benefits include CHEAP MORTGAGE, subsidised restaurant, non-contrib pension and STLS.

REF. 1771

PROGRAMMER — HANTS.
£6,000

Due to expansion and to cater for future needs the D.P. division seeks programmers to join their small friendly teams. They retain IBM 370 hardware and are seeking programmers ideally with at least 18 months' PL/1 experience but are prepared to train COBOL, FORTRAN or ASSEMBLER programmers who would like to learn a new language.

Company offers

- Excellent prospects
- Full training in PL/I
- Subsidised MORTGAGE after statutory *period*
- Super working conditions including staff restaurant and non-contributory pension scheme

REF. 1779

SYSTEMS ANALYST—LONDON
£7,500

Exciting and challenging opportunity awaits a systems analyst within this worldwide and prestige *company*. *Ideal applicant* will have programming background in COBOL and ASSEMBLER and at least 2 years' systems experience. Our client is awaiting the installation of IBM 370 in October and this is a super opportunity to work in a brand new area on new projects.

Company offers

- Super working environment.
- Excellent career opportunities.
- Recruitment of own team.
- All new development work

REF. 1618

PROGRAMMER — ESSEX
£5,000 + CO. CAR

Leading clothing manufacturer seeks prog with at least 18 months' exp. The D.P. dept at present is quite small but company is growing rapidly. Successful applicant will act as ASSISTANT to *the D.P.M. This is a superb opportunity for young* ambitious person wishing to develop with the company. They retain BURROUGHS hardware but will consider ANY HARDWARE EXPERIENCE. If you want a CHALLENGE telephone now.

Company offers

- Exciting growth potential.
- Highly progressive organisation.
- *Excellent career prospects.*
- RELOCATION expenses.

REF. 1703

PROGRAMMER — LONDON
£5,500

Due to development of advanced computer systems, successful D.P. services department seeks to boost its programming team. Retaining *large ICL 1900 equipment they offer excellent* opportunities for persons with minimum COBOL and PLAN experience.

- Training on IDMS Database.
- Development to analysis.
- Opportunities to join at senior level.
- *Applications in various areas providing an* absorbing and interesting career.
- EXCELLENT perks include FLEXI hours and 6 WEEKS' HOLIDAYS.

REF. 1780

JUNIOR PROG — LONDON
£6,000

Multi national company retaining large IBM 370 hardware requires programmers with at least 12 months' ASSEMBLER experience, to join a highly professional team. They are *currently developing* a major sophisticated on line system

Company offers

- Highly progressive organisation.
- Continued development with a well planned schedule.
- Excellent benefits including cheap travel
- Good promotional prospects

REF 1764

PROGRAMMERS—SOUTH COAST
£6,500

Major expanding British company seeks COBOL programmers, with minimum 2 years experience. *Retaining large IBM 370 and 3031* they are currently developing PL/I database and CICS and have on-going training and development programmes financed with substantial budget.

Company offers

- Pretty, coastal location.
- Good training and excellent scope to move into systems.
- Full *RELOCATION* expenses.
- MORTGAGE assistance, free life assurance, non-contributory pension scheme

REF 1732

PROGRAMMER — HOLLAND
£11,000

International company manufacturing sophisticated technical products for world-wide distribution seeks programmer for exciting newly-created *position. Company have recently installed PDP II* using BASIC + and consequently require person with good knowledge of the same, with a good personality and strong desire to accept a challenge.

- Prestige company with good American backing.
- Good deal of development work using integrated database.
- *Excellent prospects and early salary review.*

REF. 1742

MINI PROGS—LONDON/H. COUNTIES
£6,500 NEG

Prestige company operating on a global scale are recruiting person with 1-3 years' experience on ANY MINI ASSEMBLER to work in their new modern offices. Having large DEC PDP II equipment and expanding at a rapid rate, they have a wide range of on-going projects both in hardware and software areas.

- Extensive training in up to date technology
- Excellent career opportunities for training in RSX11, RT11 and RSTS
- Opportunity for further travel

REF 1714

PROGRAMMER—CITY
£6,000

Established Merchant Bank has opportunity for person with COBOL and PL/1 experience to work primarily as a programmer but also be involved with analysis. This position is in the "investment" area but company will consider any good commercial background. DL/1 Database is currently being developed, for which FULL TRAINING will be given.

- Large budget allocated for training purposes
- Variety of new development including Database
- First-class opportunity to follow an excellent career path
- CHEAP MORTGAGE and insurance, low interest loans, season ticket scheme and excellent sports/social club

REF 1711

MINI PROG—KENT
to £5,500

Our client is an international company based close to beautiful countryside. They seek *programmer with 18 months' DEC PDP 11* BASIC + experience. The hardware is being installed, offering new development in both manufacturing and financial areas.

- A challenging position with opportunities in a variety of areas.
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REF 169?

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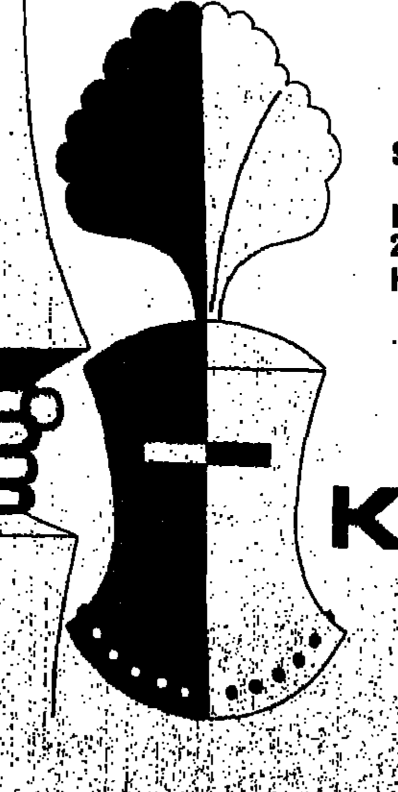

Computing Services Association

U.K.

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ICL 2903 COBOL	MIDDX	£180 p.w.			

OVERSEAS

SYSTEMS PROG CICS PL/1 + ASSEMBLER	HOLLAND	£400 p.w.	SYST 10 ASSEMBLER	HOLLAND	£350 p.w.
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HONEYWELL LEVEL 61/ OR LEVEL 62	HOLLAND	£320 p.w.	UNIVAC DMS	HOLLAND	£370 p.w.

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The existing Datapoint minis linked to BOC Datasolve's IBM 370/158 mainframe computers, are planned to be enhanced to *form a sophisticated* Datapoint ARC configuration. Systems currently operational include shop floor *control* system, manufacturing planning, personnel information and financial control applications.
Planned developments include on-line stock control and purchasing systems linked to computer aided design on the Engineering design front.
Due to Group promotions, *the need now* is to recruit two key professionals to continue our development programme.

Operations Controller
£6100-£7400 p.a.

We are *looking* for an experienced professional with at least 5 years D.P. experience, of which two must have *been in an operational role, or as a* senior technical programmer with software and telecomms experience. Supervisory experience must have encompassed data control, data preparation as well as computer operations.

Strong leadership and man-management *skills are essential, as is the ability* to play a key role in providing a first class service to users of on-line systems. The position should appeal to men or women, aged between 26 and 35, ready for their first major management role.

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£5800-£7000 p.a.

We are looking for a senior programmer who is seeking to consolidate his supervisory experience. He or she will control in-house permanent programming staff, contract staff and fixed price contract applications via software houses. Extensive experience of IBM *OS Cobol is essential and experience* within a complex mini computer environment highly desirable. Exposure to *tight project control in a programming* sphere would be an advantage.

These positions offer a stimulating and *interesting opportunity in continuing an* ambitious development programme. Career prospects within the BOC Group are first class for successful applicants and attractive salaries will be paid according to experience.
The Company is located in North London and assistance with relocation will be provided where relevant.
To apply please write or *telephone*
The Personnel Manager,
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Tel. 01-803 1300

Cryoplants

1976

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Due to an increasing volume of development work, our clients (a major West End installation using ICL 2980, 1900 and minis) have asked us to *recruit for several career openings*. These offer

- database, real time and communications applications
- the technical challenge of *large-scale* systems
- training in modern techniques
- good working environment (new offices, staff restaurant)
- sound career path and advancement prospects

SYSTEMS ANALYSTS £6000-£7000

These posts will interest analysts with limited experience at the lower end of the bracket to more experienced practitioners at the upper end. Your *background* could be on any applications and on any hardware. (Ref. 672)

SOFTWARE PROGRAMMERS c. £6200

Here's an opportunity to learn about VME/B and IDMS, and to use MAC and TP techniques. This *opening will appeal to programmers who have* worked in a software or systems programming role an ANY MAINFRAME. (Ref. 800)

APPLICATIONS PROGRAMMERS Up to £5600

Do you want to gain experience of the latest ICL hardware and software at a professionally-run installation? Would database and real-time experience enhance *your career* prospects? You should have had two years or so as a programmer, ideally including COBOL. However, if you have used another mainframe language, retraining will be provided. (Ref. 686)

POTENTIAL SYSTEMS ANALYSTS £4500-£5600

This is a rare chance for a programmer or analyst/programmer to move to Systems Analysis, and to play a meaningful role after training. Candidates should have a background of at least three years' programming, or a Computer Science degree, or a recognised analysis diploma. (Ref. 880)
Please ring us for a confidential exchange of information. If more convenient, leave a message on our answering machine after hours and we'll phone you at home.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

LOGISTIX

Data Processing Recruitment Consultants

Mini Analysts+Programmers Holland
Salaries: £9.5—15K.

Our Client is a major International Systems and *Software Development Group recognised* as Market-leaders in their field. Owing to continued expansion in a wide variety of applications areas including Data Communications, Message Switching, Computer Networking and Mini Computer Software, a significant number of experienced permanent personnel are *urgently required.*
Emphasis will be placed on technical achievement and in-depth experience in the areas of activity outlined above. *Whilst a degree or equivalent qualification in* either Computer Science or Mathematics is desirable, significant relevant experience will be considered in lieu.
Of essence is a solid Assembler background within a *Mini-computer environment. Project locations* throughout the Benelux provide a wide and interesting environment which include Amsterdam, The Hague *and Rotterdam. Of prime importance is demonstrable* enthusiasm to re-locate to the Netherlands for an extended period. Every assistance will be given in *relocation, including cost of removal of all personal* effects, initial accommodation expenses and a resettlement advance.
Interviews will be held in London within 14 days and offers will subsequently be made inside one week.

Main-Frame + Mini Programmers Greater Manchester
Salaries: £6—9.5K (a.a.e.)

A very prestige client with headquarters in London and regional offices located in Cheshire and throughout *Europe urgently requires the following*: Real-Time and on-line Programmers, Systems and Data base designers and compiler specialists with 2–5 years experience.
Of particular interest would be people with relevant experience in one or more of the following: IBM or ICL with Assembler, PL/1 or COBOL and Ferranti, DEC with Basic, RTL II or Coral. Also IMS or similar and Data Base design personnel are urgently sought.
The scope of projects is both broad and demanding and certainly in keeping with the prestige of this client. You will play an important role in project development and *the opportunity to enhance your technical expertise* is one of the attributes of working with this reputable group. Fringe benefits are well above average and full *relocation expenses will of course be met.*

Freelance IMS PL/1 Amsterdam
£400 p.w. Min. 6 months.

A Dutch client has an urgent requirement for two freelance programmers to join an existing team developing a range of applications suites using PL/1 under IMS (DB + DC). Suitable applicants will be well grounded in IMS applications programming and will have at least two years of PL/1 experience. Availability within a few weeks is of paramount importance.
In addition to a very high rate of pay our client will take the unusual step of providing full relocation costs and render assistance in location of accommodation in Amsterdam. They will also consider provision of paid temporary accommodation in the initial weeks of settling in.
Applications will be varied, interesting and above all demanding. This contract is for a minimum of 6 months but may well be extended. Brief interviews will be held as soon as you can become available to be held in London or Amsterdam.

IBM T.P. or Database C. London + E.E.C.
Salaries: £16K (E.E.C.) £7 — 9.5K (U.K.)

A multi-national U.S. Corporation specialising in Teleprocessing and Network design and Implementation has retained Logistix to seek out and identify senior personnel for their Central London and several of their E.E.C. based offices. In particular they require Business Analysts and Programmers. Suitable applicants must have current in depth knowledge of either IMS (DB or DC), CICS/VS, TOTAL, SHADOW, ADABAS or similar T.P/Database software preferably in an O.S. environment. Programmers will be using either COBOL or PL/1 but BAL would be acceptable.
The scope of projects in which our clients are engaged is very broad-based and should appeal to even the most demanding and forward thinking candidates. The very high salaries reflect the prominence which our client places on the acquisition of these key personnel.
Early interviews are envisaged and offers will be made within 10 days.

Micro or Mini Specialists South-East and North
Salaries: £5 — 9.5K + Overseas travel

Our prestige client has established the reputation as market leaders in their field and offers exceptional *career prospects to ambitious and talented analysts* and programmers seeking above all job satisfaction, forefront applications development, *prestige associated with working for this acclaimed* International Company and not least a salary reflecting appreciation of your true worth.
Candidates should possess a minimum of 18 months practical involvement in applications or software design and development in either a computer manufacturing or Systems House environment. Those who have BASIC or Assembler language experience on Mini or Micro Computers particularly DEC PDP 11, DG NOVA/ECLIPSE and TI 900/9900 or specific Micro-Processors preferably Intel 8080/5, Zilog *Z80 or Motorola 6800 will be ideally suited.*
In addition to an above market starting salary our clients offer excellent career advancement *prospects and the opportunity to travel within* Western Europe. Initial interviews on our clients premises will be held within 14 days.

Logistix, Freepost 32, London WIE 3YZ
01-491 4636 (Reverse charges) **Telex 28800**

LOGISTIX

Avon House, 366 Oxford Street, London WIN 9HA